DOCUMENT RESUME

ED 074 883 HE 003 449

AUTHOR	Ziemer, Gordon; And Others
TITLE	Cost Finding Principles and Procedures. Preliminary Field Review Edition. Technical Report 26.
INSTITUTION	Western Interstate Commission for Higher Education, Boulder, Colo. National Center for Higher Education Management Systems.
SPONS AGENCY	Office of Education (DHEW), Washington, D.C.
PUB DATE	Nov 71
CONTRACT	OEC-0-8-980708-4533(010)
NOTE	308p.
EDRS PRICE	MF-$0.65 HC-$13.16
DESCRIPTORS	*Budgeting; *Cost Effectiveness; Costs; *Educational Economics; Educational Finance; Evaluation Methods; *Higher Education; *Resource Allocations

ABSTRACT

This report is part of the Larger Cost Finding Principles Project designed to develop a uniform set of standards, definitions, and alternative procedures that will use accounting and statistical data to find the full cost of resources utilized in the process of producing institutional outputs. This technical report describes preliminary procedures for identifying, measuring, distributing and allocating costs, and for determining the cost of various types of outputs (i.e., projects, courses, student credit hours, etc.). Included are discussions of the distribution of cost categories to the cost centers, and allocation of the costs of the support cost centers to the primary cost centers. (Author/CS)

FILMED FROM BEST AVAILABLE COPY

ED 074883

COST FINDING PRINCIPLES AND PROCEDURES

PRELIMINARY DRAFT
for review purposes only.

Preliminary Field Review Edition
Technical Report 26

COST FINDING PRINCIPLES AND PROCEDURES: Preliminary Edition

TECHNICAL REPORT 26

National
Center for
Higher
Education
Management
Systems
at WICHE

U.S. DEPARTMENT OF HEALTH,
EDUCATION & WELFARE
OFFICE OF EDUCATION
THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL OFFICE OF EDUCATION POSITION OR POLICY

HE 003 419

National Center for Higher Education Management Systems at WICHE

Executive Director, WICHE:
Robert H. Kroepsch

Associate Director, WICHE, and
Director, National Center for
Higher Education Management Systems
at WICHE:
Ben Lawrence

The Western Interstate Commission for Higher Education (WICHE) is a public agency through which the 13 western states work together

. . . to increase educational opportunities for westerners.

. . . to expand the supply of specialized manpower in the West.

. . . to help universities and colleges improve both their programs and their management.

. . . to inform the public about the needs of higher education.

Director, Research Program:
Robert A. Wallhaus

Director, Development and Applications Program:
Warren W. Gulko

Director, Training and Implementation Program:
Robert Huff

Program Associate:
Gordon Ziemer

Program Associate:
John Minter

Communication Associate:
Joanne E. Arnold

The Program of the National Center for Higher Education Management Systems at WICHE was proposed by state coordinating agencies and colleges and universities in the West to be under the aegis of the Western Interstate Commission for Higher Education. The National Center for Higher Education Management Systems at WICHE proposes in summary:

To design, develop, and encourage the implementation of management information systems and data bases including common data elements in institutions and agencies of higher education that will:

- provide improved information to higher education administration at all levels.
- facilitate exchange of comparable data among institutions.
- facilitate reporting of comparable information at the state and national levels.

This publication is in the public domain in accordance with the
U.S. Office of Education contract number OEC 0-8-980708-4533 (010)

ED 074883

COST FINDING PRINCIPLES AND PROCEDURES

PRELIMINARY FIELD REVIEW EDITION

Technical Report No. 26

November 1971

Preliminary Draft For
Review Purposes Only.

Prepared By

Gordon Ziemer
Michael Young
James Topping

The National Center for Higher Education Management Systems
at WICHE

P. O. Drawer P Boulder, Colorado 80302

Under a Contract with
The Department of Health, Education, and Welfare

Contract Number HEW-OS-70-129

TABLE OF CONTENTS

Chapter Page

I. INTRODUCTION. 1

II. DEFINITION AND USES OF COST DATA. 8

Cost Defined. 8
Opportunity Cost. 11
Implicit Costs. 13
Average Versus Incremental Costs. 14
Current Expenditures. 18
Joint Product Costs 19
Transfer Payments 20

III. INSTITUTIONAL DATA SOURCES. 21

The Accounting System 21
Statistical Data Elements 23

IV. A PROGRAM CLASSIFICATION STRUCTURE (PCS). 24

PCS and the Cost Finding Principles Project 24
Programs and Program Elements 25
Primary and Support Programs. 26

V. PRELIMINARY COST AGGREGATION STRUCTURE. 32

VI. DISTRIBUTION OF COST CATEGORIES 41

Distribution. 41
Cost Categories 42

Salaries and Wages. 42

Distribution of salaries for those employees subject to an FAA. 45
Alternative I. 45
Alternative II 49

Chapter Page

Distribution of salaries and wages of primary program non-FAA staff. 49
Alternative I. 49
Alternative II 50
Alternative III. 53

Distribution of salaries and wages of support program non-FAA staff. 54

Supplies and Expenses 55
Alternative I 55
Alternative II. 56
Alternative III 57

Capital Assets. 57
Useful life 59
Salvage value 59
Replacement costs 60
Depreciation methods. 65

VII. ALLOCATION OF SUPPORT COSTS 66

Allocation Methods. 67
Direct. 67
Recursive (Step-down) 68
Cross-Allocation (Simultaneous) 69

Procedures for Direct Allocations 69
Procedures for Step-down Allocations. 71
Student Support Cost Centers. 73

VIII. COSTING PROGRAM ELEMENTS AND DETERMINING AVERAGE COST. 88

Project Costing 89
Unit Costing. 89

APPENDICES
A. INSTITUTIONAL ACCOUNT CLASSIFICATION 92
B. PROGRAM CLASSIFICATION STRUCTURE 104
C. ACTIVITY CROSSOVER 116
Institutional Activity Analysis/Activity Crossover 116
Reclassifying Expenditures 119
Sample Crossover 122
D. FACULTY ACTIVITY ANALYSIS PROCEDURES MANUAL. 141

Chapter Page

APPENDICES (Continued)

E. SAMPLE ALLOCATIONS. 161
F. UNIT COSTS OF INSTRUCTION: A METHODOLOGICAL APPROACH 200
G. COST FINDING PRINCIPLES COMPUTER PROGRAMS 267

GLOSSARY. 284

NOTES 294

LIST OF FIGURES

Figure Page

1 The Relationship of Average Cost per Incremental Degree to Average Cost per Degree. 17

2 Organization of the Program Classification Structure. 28

3 Faculty Activity and Output Survey Form. 46

LIST OF TABLES

Table | Page

1 Incremental and Average Costs. 16

2 Distribution of Faculty Member's Salary to Cost Centers, Alternative I 47

3 Aggregation of Faculty Salaries in Cost Center 1.1.1103.20 48

4 Aggregation of Nonfaculty Salaries and Wages by HEGIS Discipline Category 51

5 Distribution of Nonfaculty Salaries and Wages to Cost Centers, Alternative II. 52

6 Distribution of Nonfaculty Salaries and Wages to Cost Centers, Alternative III. 54

7 Building Replacement Cost (Campuswide) 61

8 Equipment Replacement Cost 64

9 Example of the Direct Allocation Technique, Step 2 70

10 Example of the Direct Allocation Technique, Step 3 71

11 Example of the Step-down Allocation Technique, Step 3 72

12 Example of the Step-down Allocation Technique, Step 4 73

TO THE HIGHER EDUCATION COMMUNITY:

The Field Review Edition of the Cost Finding Principles and Procedures Technical Report is being sent to the liaison person for each participating institution. It is also being sent to those subscribing to our publications.

The purpose of this technical report is to present the preliminary principles and procedures for identifying, measuring, distributing, and allocating costs. In addition, there is a discussion on the calculation of the cost of various types of outputs; i.e., projects, courses, student credit hours, etc. The technical report has been prepared by the Center staff, working with a task force representing small colleges, community colleges, state colleges, and universities -- both privately and publicly controlled.

The Field Review Edition is designed to convey to prospective users the preliminary principles and methodologies as conceptualized by the Center staff and a nine-member task force and subsequently reviewed and approved by an advisory review panel. We realize that this preliminary edition may have omitted important principles and procedures; therefore, your reaction as a user to this product is a very important step in the process of producing a viable and realistic first edition. We ask you to point out changes or corrections that will improve the principles and procedures for the benefit of the user. Please circulate this edition within your institution to those who might be in the best position to review it critically and constructively. Any comments or suggestions on how the technical report can be improved to serve the needs of the user will be appreciated. Written comments may be in the form of letters or as notations in the technical report returned to us. The suggestions received from throughout the higher education community will be reviewed and incorporated as appropriate in the first edition, which is scheduled for publication in the fall of 1972. You will receive a revised copy at that time.

Ben Lawrence

Ben Lawrence, Director
National Center for Higher Education
Management Systems at WICHE

ACKNOWLEDGMENTS

Many people have contributed to the preparation of this draft edition of the Cost Finding Principles Technical Report. In addition to the Task Force and Advisory Review Panel members listed on page 4 of this document, we would like to give special recognition to:

Mr. James B. Farmer, Director, Analytic Studies Division, The California State Colleges, for his initial drafting and writing of the project proposal, his initial conceptualization of project problems and direction, his writing of an early project position paper that ultimately led to this technical report, his assistance in the computer program design, and his continuing support and positive criticism throughout the project.

Mr. Gary M. Talesnik, Project Officer, the Division of Contracts and Grants Administration, Office of the Secretary, Department of Health, Education and Welfare, who spent many long hours with the project staff reviewing rough drafts and making significant contributions and positive criticism. Mr. Donald Greene and Mr. Hank Kirschenmann of HEW also provided valuable assistance and guidance.

Dr. Robert D. Lamson, Assistant Vice President for Planning and Analysis, University of Washington, who worked as a consultant on the project. In addition, Mr. John H. Powel, also of the University of Washington, in conjunction with Dr. Lamson, provided considerable conceptual input through the GRADCOST study.

Mr. Charles R. Thomas, Executive Director of CAUSE, formerly of NCHEMS, for his critique of the computer program systems design and also for his assistance in implementing the programs at several of the pilot institutions.

Mr. John G. Harrison, Director of Information Systems, Chancellor's Office, California State Colleges, who served as a consultant on the project and was responsible for providing the program specifications and design. In addition, Mr. Harrison did an excellent job coordinating and supervising the programming effort.

Mr. Timothy J. Fitzpatrick, Information Systems Division, California State College System, who programmed CFP01.

Mr. W. J. Boles, Computer Center Manager, San Fernando State College, who programmed CFP03 and CFP05.

Mr. Michael J. Strumwasser of the UCLA Law School, who programmed CFP08.

In addition, numerous individuals from the pilot institutions have worked diligently behind the scenes in support of the project. They are:

Jeffery Balling, SUNY at Brockport
John Berry, Dartmouth College
Foster Blough, Dartmouth College
Dallas Fox, Florida State University System
Bill Hunt, Florida Atlantic University
Tom Kuffell, University of Washington
Will Pierce, University of Illinois
Gordon Smith, University of Utah
Bill Witsher, Stanford University

NCHEMS staff members who took the time to provide a critical review: Dr. Robert A. Huff, Mr. Dennis Jones, Mr. Leonard Romey and Dr. Robert A. Wallhaus. Mr. William J. Collard for his assistance in the design of the computer programs and help in implementing the programs at several of the pilot test institutions, and Miss Kathy Neward for her assistance in preparing Appendix E of this document.

Dr. Ben Lawrence, Director of the National Center for Higher Education Management Systems at WICHE, and Dr. Warren W. Gulko, Director of the Development and Applications Unit of NCHEMS, for their thoughtful review of the previously mentioned position paper and their behind-the-scenes efforts in gaining consensus support for the project.

Finally, Mrs. Kathleen Kelly, Mrs. Jodi Kelley, and Mrs. Carol Sterrett for their excellent secretarial assistance, which often occured on weekends and late evening hours.

Chapter I

INTRODUCTION

The objective of the Cost Finding Principles Project is to develop a uniform set of standards, definitions, and alternative procedures that will use accounting and statistical data to find the full cost of resources utilized in the process of producing institutional outputs. This standard set of principles and procedures will allow for the development of cost data that, given careful consideration and assuming common data element definitions and standard aggregation methodologies, can facilitate interinstitutional data exchange. In addition, if institutions calculate costs for a number of years using consistent procedures, such costs might then be analyzed to explain better the variations in average costs and to determine incremental costs. The ultimate uses of a fully tested set of cost finding principles include the following:

1. The use of full average and project cost as a means of "pricing" at given levels of operation
2. The ability to calculate and analyze incremental costs for different levels or ranges of operation as an aid to internal resource allocations
3. The use of average cost as an aid when exchanging program costs within and among institutions, in order to spotlight potential institutional problem areas that will require further analysis and possibly result in policy changes

4. The use of both total cost and incremental cost as a starting point for cost benefit analysis (assuming the development of some means of identifying and measuring the benefits)
5. Attainment of a better understanding of the cost of the educational process
6. The provision of information on costs of various programs carried on by institutions of higher education
7. Use by institutions of higher education and Federal, state, and local governments for planning purposes.

The CFP Project, HEW Contract OS-70-129, operating within the National Center for Higher Education Management Systems (NCHEMS) at WICHE, is being conducted in two phases. Phase I was funded on June 8, 1970, and was designed to develop a preliminary set of standards, definitions, and alternative procedures that would use accounting and statistical data to find the full cost of resources utilized in the process of providing institutional outputs. Phase I products are:

1. This Technical Report describing preliminary principles and procedures for identifying, measuring, distributing, and allocating costs, and for determining the cost of various types of outputs (i.e., projects, courses, student credit hours, etc.). Generally, the principles and procedures discussed in this paper include:

a. Distribution of cost categories (i.e., objects of expenditures) to the cost centers. In some cases, a crossover from the institutional expenditure accounts to a program classification (cost aggregation) structure is necessary. The matching of expenditure accounts to cost centers will be accomplished by analyzing the activities supported by the expenditures and identifying the corresponding cost centers. In other cases, faculty costs may need to be distributed to cost centers on the basis of a faculty activity analysis or faculty assignment analysis.

b. Allocation of the costs of the support cost centers to the primary cost centers. These allocations will be performed by utilizing a number of different statistical data elements (i.e., allocation parameters such as student credit hours, assignable square feet, expenditures, etc.).

c. Procedures for determining the full costs of various program elements, such as courses and projects, and the average cost of program measures, such as student credit hours.

2. A plan for testing the principles during Phase II.

3. A set of computer programs and documentation that will facilitate the pilot test activities in Phase II.

The various principles and procedures that would be usable by a broad spectrum of institutions for determining and associating costs with activities and allocating the costs of support activities will be tested, analyzed, and refined during Phase II of the project. Through the testing of the various costing procedures and methods, and based upon the judgment of the members of the task force listed below, a set of reasonable and practical cost finding principles and procedures will be recommended along with the rationale for using alternative methods where appropriate or necessary. The Phase II test will provide the opportunity for revising the principles and procedures and will incorporate any omissions that may have been overlooked during the initial developmental stage.

Cost finding principles and procedures are being developed by NCHEMS in conjunction with a task force composed of representatives from nine institutions of various sizes and types. The task force members, along with the institution they represent, are listed below:

1.	Wallace C. Treibel	University of Washington
2.	James W. Stevens	Dartmouth College
3.	Michael M. Roberts	Stanford University
4.	Garland P. Peed*	State Center Junior College District, Fresno, California

5.	Maurice Kleiman	State University of New York College at Brockport
6.	Peter Jegers	University of California
7.	Stephen F. Jablonsky	University of Illinois
8.	Gary H. Hughes	University of Utah
9.	Marc E. Hall	State Center Junior College District (Fresno)
10.	W. K. Boutwell, Jr.	State University System of Florida

*Technical Council Representative

The recommendations of the task force are subsequently reviewed by the project advisory review panel consisting of the following members:

1.	Paul Wileden	National Association of State Budget Officers
2.	James W. White	American Association of Junior Colleges
3.	Susuma Uyeda	U. S. Office of Management and Budget
4.	Sheldon Steinbach	American Council on Education
5.	Leon Schwartz	National Science Foundation
6.	Clarence Scheps	Tulane University
7.	J. Boyd Page	Council of Graduate Schools in the United States
8.	D. Francis Finn	National Association of College and University Business Officers
9.	Thomas Campbell	Association of American Medical Colleges

In addition to this extensive review process, several federally funded projects provide inputs to the NCHEMS Cost Finding Principles Project.

The Association of American Medical Colleges (AAMC) Cost Allocation Study has been in existence for a number of years. This project is concerned with examining various allocation techniques and allocation parameters. In addition, the AAMC has been highly concerned with faculty activity analysis as a means of distributing costs. The expertise derived from this research is helpful to the Cost Finding Principles Project.

The Gradcost study, jointly supported by the Council of Graduate Schools in the United States (CGS) and the National Association of College and University Business Officers (NACUBO) and funded by the National Science Foundation is a companion study to the Cost Finding Principles Project. It was designed primarily as a literature search to assess the present "state of the art" with respect to costing in higher education. The Cost Finding Principles Project relied on much of the work of the Gradcost group in surveying past cost studies. The result of that project, contained in two volumes entitled A Study of the Costs of Graduate Education,[1] represents an excellent compendium of the conceptual issues associated with the estimation and analysis of costs at institutions of higher education. It is worthy of review by those interested in the concepts of resource allocation as well as those actually involved with performing cost studies.

This research points out that while numerous cost studies have been conducted since the early 1920s, each approaches the problem of costing in a conceptually different way. One apparent need perceived by this survey which will be filled in part by the Cost Finding Principles Project is the establishment and acceptance of uniform standards, definitions, and procedures that will allow costing to provide a means to understand better the education process at an institution of higher education. The Cost Finding Principles Project will take into account past cost studies and the conceptual issues set forth by the Gradcost Study and, in light of this experience, develop a set of standard principles and procedures.

Chapter II

DEFINITION AND USES OF COST DATA

Cost Defined

The term cost has many different meanings to different people. For example, if one were to try to determine the cost of a trip to Europe, there could be more than one answer. Does one include the value of the time spent on the trip; the depreciation of assets used such as a car, camera, or luggage; the value of directions, or use of public facilities, etc.? The answers to these questions will vary depending upon the intended uses of the cost information. The apparent cost of the European trip will fluctuate accordingly.

Likewise, the terms "expense" and "cost" have been defined many different ways in accounting, economics, and cost manuals. For example:

1. In College and University Business Administration "expenses" are defined as "charges incurred, whether paid or unpaid, for operation, maintenance, and interest and other charges for operating purposes during the current fiscal period."[2] Costs are not defined in this text.

2. In Cost Finding and Rate Setting for Hospitals "expenses" are defined as:

> expired costs, that is, costs that have been used or consumed in carrying on some activity and from which no measurable benefit will extend beyond the present. Cost,

> then, is the monetary valuation applied to an asset or service that has been obtained by an expenditure of cash or by a commitment to make a future expenditure. When these costs are used or consumed in rendering services to patients, they are classified as expenses.[3]

However, costs and expenses were used synonymously in this study.

3. The American Heritage Dictionary of the English Language defines expense as "the cost involved in some activity; a sacrifice; a price....Cost is an amount paid or required in payment for a purchase."[4]

4. In the Matz, Curry, and Frank's text on Cost Accounting the discussion on cost indicates that:

> An analysis...reveals that there are many types of cost. The historical meaning of the term "cost" is modified by such descriptions as direct, prime, indirect, fixed, variable, controllable, product, joint, estimated, standard, future, replacement, opportunity, imputed, sunk, differential, and out-of-pocket. Each modification implies a certain attribute which is important not only to the cost accountant who uses the concept but also to business management to whom these costs must convey a specific meaning and message.
>
> An abstract definition of cost is not sufficient for an understanding of the term. A cost must be understood in its relationships to the purpose or purposes for which it is to serve. A request for cost data should often be countered by a question asking the ultimate use to be made of such data.[5]

5. In another cost study a review of costs as viewed by economists resulted in the following conclusion:

> The concept of cost in economics has been defined in a number of fundamentally different ways: the aggregate of physical factors of production, the efforts or sacrifices of individuals, the alternative product given up by use of factors of production, total (market) price of the factors or inputs. Some of these can be measured in terms of socially established values, while others are individualistic and therefore "subjective." Historically, the economist's concern with cost has been largely descriptive rather than normative.[6]

It should be quite clear from the above quotations that there are no absolute definitions of either the term "cost" or "expense." The term "cost" must be understood in its relationship to the purpose or purposes for which it is to serve.[7]

Thus, in order to attain the objectives of the Cost Finding Principles Project, specifically the development of a set of uniform principles and procedures, there needs to be a standard definition for "cost."

Costs, for the purposes of Cost Finding Principles, are defined as the measure in dollars of institutional resources used in the process of providing institutional outputs during a given time period.

Opportunity Cost[8]

Opportunity cost, in the economic sense, is a benefit foregone. Any resource with alternative uses that is committed to the production of higher education outputs is a component of the cost of purchasing those outputs. If the resource is of a type that can be consumed in one account period, its opportunity cost may be equivalent to its market price, assuming a competitive market. If, on the other hand, the resource is an asset that yields benefits for more than one accounting period, its market price will be equivalent to the discounted sum of the opportunity cost of its services in each period of its expected life. Two important assets that are inputs to higher education are human and physical capital. To some extent the opportunity costs of both types of assets are reflected in institutional expenditures. Wages and salaries, for example, represent compensation of labor services for opportunities foregone, while in some cases rental of physical assets represents similar compensation for the services of these assets.

In two important respects, however, opportunity costs of both human and physical capital are not reflected in costs at the institution. First, students who forego alternative employment in order to undertake educational activities bear the sacrifice of earning from the employment foregone. There are two components of the potential earning sacrifice by students. The largest component, of course, is the personal or disposable income that remains after taxes. The second component is social or public in nature, i.e., the potential contribution to tax revenues that are foregone.

The second type of opportunity costs that are not reflected in costs at the institution relates to physical capital. Many forms of physical capital are employed by institutions of higher education. However, under capital budgeting systems commonly used in higher education, the opportunity cost either in the sense of interest on original cost or in a sense of current lease value of these assets is often not taken into account.

Opportunity costs of physical capital may be represented by either the annual lease value or the annual interest on the capital value, whichever is higher. Construction or purchase of facilities by institutions of higher education is usually financed directly through the institution by traditional sources of funds: industry or alumni donation, legislative appropriation, tuition, and fees. The interest foregone on the funds involved is usually borne directly by the funding agent itself and is not figured in the actual institutional capital budget. This, of course, may not be true in the case of bond financed capital facilities, nor will it be true in the case of leased facilities. However, to the extent that facilities are financed by direct capital grants, the interest cost of such grants is a social cost not reflected in institutional expenditures, making the problem of measuring and evaluating actual capital costs difficult.

The concept of opportunity cost is sound and in some cases may be a useful tool for planning purposes. However, in most cases it is a difficult concept to implement at all institutions on a uniform basis because of the difficulty of measuring "market value" or determining the benefit foregone. For this reason, the Cost Finding Principles and procedures do not incorporate this concept.

Implicit Costs

The resources used will include such typical factors of production as faculty and supporting staff, supplies and expense, and capital assets. The dollar cost will be measured in terms of the price paid for resources used during a given period by the institution, excluding those costs of resources primarily intended for use by others and utilized by the institution only incidentally (e.g., city maintained public roads, fire and police protection, and public libraries). These implicit costs measure resources partially utilized by higher education institutions, but not paid for by them. In many cases where the use of these resources is substantial, it would be worthwhile within the institution's internal program review and decision-making process to determine what the cost would be if the institution suddenly had to provide the services itself. This kind of information, along with a general awareness of implicit costs, is a necessary part of comparing interinstitutional cost data since it partially explains why costs vary among institutions.

Knowledge of implicit costs may be important for certain institutional decision-making purposes. Depending on the intended use of the cost study, certain implicit costs should be included when it is practical and feasible to measure them.

A few examples of implicit costs that an institution may wish to consider are:

1. Contributed services by medical doctors
2. Services rendered by post doctoral staff
3. Donated computer services

Average versus Incremental Costs

Historically, institutional cost studies have been used primarily as a means for justifying requests for funding. In the process of seeking funds, higher education administrators employed costs, however obtained, as an indicator of educational value, implying that cost studies were in essence the process by which higher education administrators valued outputs for their constituencies. Cost studies have become an important part of the budgeting and resource acquisition process because they were used to develop budgeting formulas.

The fact that cost studies became such an integral part of the process by which support was negotiated put constraints on the nature of information that was gathered. Since budgets were typically negotiated in lump sums rather than in increments over previous levels of support, funding agencies tended to be most interested in knowing what the total cost of running the institution would be. As a result, cost studies tended to focus on total costs or total cost per student rather than incremental costs, the cost of changing the level of enrollment from one year to the next. Given the predominant historical use of cost studies, it is not surprising that the procedures used tended to focus on total actual costs of various educational outputs rather than on the way in which these costs varied with outputs.

The average cost is defined as the total cost divided by some unit such as student credit hours, full time equivalent students, etc. Average or unit cost describes what goes on at one particular level of output, but may not be an appropriate indicator of costs at another level. Incremental costs, on the other hand, are equal to the change in total costs that result from going from one level of output to another. Thus, many management decisions tend to consider "incremental costs" -- the cost to the institution of adding or deleting a program or program element. For example, the "incremental cost" of a new student major may be small, requiring only a few faculty and no new facilities. Since the new major uses the resources of other departments and, perhaps, the resources of the parent department, then the "average cost" is usually similar to other student majors. Economists use the term "marginal cost" to mean the cost of producing one more item, and marginal and incremental costs have the same meaning when referring to the same "one more item." However, marginal cost in the strict theoretical sense means one more unit of output, while incremental cost frequently refers to a program or project involving more than one unit. Thus, one could say, "The incremental cost of the new computer science department will be $346,000," and at the same time say, "The marginal cost of a computer science major is $25, while the average cost of a computer science major is $4,800 per year."

Assuming that changes in the level of output occur from year to year, average cost can be utilized as the basis for determining incremental costs. Table 1 and Figure 1 (page 17) explain this relationship:

TABLE 1

Incremental and Average Costs*

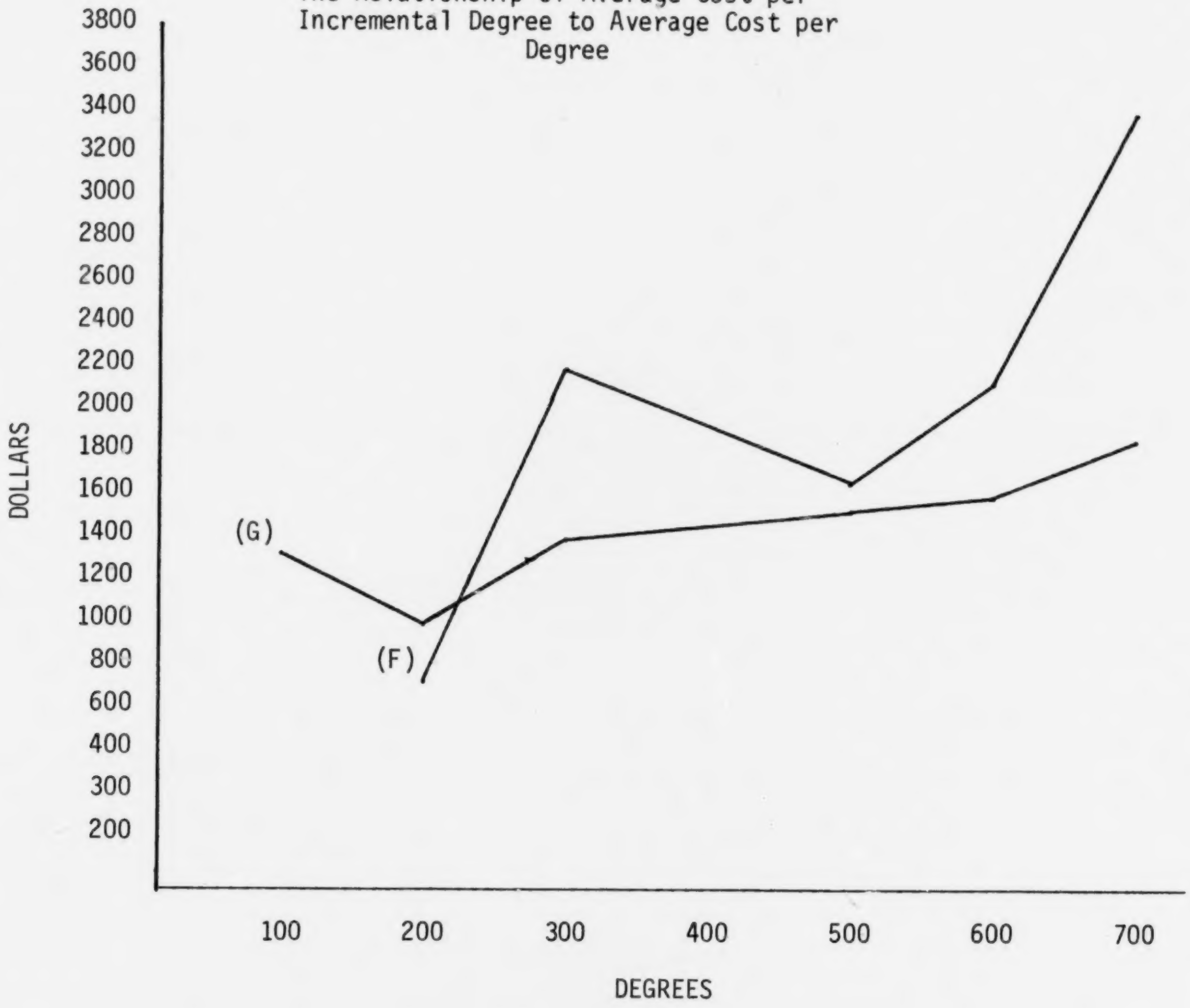
(A) Production Level or Year	(B) Degrees	(C) Total Cost	(D) Incremental Cost	(E) Number of Incremental Degrees	(F) Average Cost per Incremental Degree (F = D÷E)	(G) Average Cost per Degree (G = C÷B)
I	100	130,000				1,300
			70,000	100	700	
II	200	200,000				1,000
			220,000	100	2,200	
III	300	420,000				1,400
			330,000	200	1,650	
IV	500	750,000				1,500
			210,000	100	2,100	
V	600	960,000				1,600
			335,000	100	3,350	
VI	700	1,295,000				1,850

*Adjusted to current dollars

From Table 1 and Figure 1 (page 17), it can be seen that for Production Levels I and II, average cost per incremental degree is less than average cost per degree. Beyond Production Level II, however, the law of diminishing returns has set in, so that the incremental costs for additional output are greater

FIGURE 1

The Relationship of Average Cost per Incremental Degree to Average Cost per Degree



F = Average Cost per Incremental Degree

G = Average Cost per Degree

than average cost per degree at the level of output already attained. Thus, this example reflects the fundamental link between total, average, and incremental costs. If incremental costs are less than average costs, then average costs will fall with the production of additional outputs. If, on the other hand, incremental costs are greater than average costs, average costs will increase with the production of additional outputs.

This example illustrates the fact that average cost information, if calculated consistently over time, may in fact be used to convey certain "incremental information" about whether average costs appear to be consistently increasing or decreasing at different levels of output.

Current Expenditures

Current expenditures, as defined in most fund accounting systems for higher education represent payments made within an accounting period for faculty and staff salaries, and other forms of compensation; consumable supplies and materials, services and other costs of operations; as well as expenditures for equipment.[9] Within the Cost Finding Principles Project, current costs are part of total costs but not all current expenditures will be included because expenditures do not always coincide with use of the resources. Thus, short accounting periods would produce significant distortions of operating costs. For example, office supplies used throughout the year could be distributed to faculty members at the beginning of the year. Clearly, this is not September's cost. Most institutions use a fiscal year as the basic accounting period for costing, though shorter periods of time (e.g., a month for payroll and a quarter for financial statements) are used for fund accounting and financial control. To some extent, fiscal year accounting avoids the disparity between the cost of resources utilized and the institutional cash flow inherent in shorter time periods. The Cost Finding Principles Project will utilize fiscal year data in its testing methodologies in order to dampen the time disparity between true cost incurrence and cash flow.

Joint Product Costs

Joint product costs are costs that are incurred in association with an activity that in turn produces outputs for more than one program (i.e., joint products). The most frequently cited example of a joint product cost is the salary of a faculty member who is engaged in a research project that has instructional and research outputs.

In order to determine accurate unit costs related to output units (within cost centers), it is necessary to analyze the resource mix within the cost centers. Since approximately 70 per cent of institutional cost is for salaries, it appears reasonable to spend considerable effort in determining joint product costs within salary expenditures. One approach would be to perform an historical faculty activity analysis, which would attempt to identify how the faculty spent its time by cost center within a given time period.

Another approach would be to perform a faculty assignment analysis, which would indicate how the faculty's time is to be allotted to cost centers. The underlying assumption within the assignment analysis is that a close correlation exists between assignments and activities (i.e., faculty members distribute their time in approximately the manner expected). Both alternatives will be described and tested within the Cost Finding Principles Project.

Transfer Payments

Transfer payments represent funds received by the institution from government, business and other sources which are subsequently distributed to third parties. These funds do not represent direct payment for services rendered by the institution. For example, institutions administer many student financial aid funds. The institution receives and then disburses these funds to students. This part of the transaction is analogous in type to social welfare and should be considered as a transfer payment, not as revenue or expense (though the cost of administering student financial aid would be an expense).

Chapter III

INSTITUTIONAL DATA SOURCES

The Accounting System

Most institutions of higher education follow the accounting principles and procedures contained in College and University Business Administration. These principles and procedures were developed according to the concept that accounts should be arranged and classified so that funds having like characteristics and restrictions will be reported in appropriate fund groups (See Appendix A).

> A fund is established to carry on specific activities or attain certain objectives in the operation of an institution, either at the discretion of a governing board or in accordance with regulations or limitations imposed by sources outside the institution. In order to ensure observance of limitations and restrictions placed on use, a separate account must be maintained for the balance of each fund, it must reflect the results of its transactions or operations. For reporting purposes, funds subject to similar restrictions, or available for like purposes, should be assigned to a fund group, and each fund group should be treated as a separately balanced entity. The usual fund groups are: current funds, loan funds, endowment and similar funds, annuity and life income funds, plant funds, and agency funds."[10]

The accounting system based on the principles and procedures described in College and University Business Administration shows expenditures by function, organizational unit, and object, such as salaries, supplies and expenses, and equipment. The two primary purposes of the system are:

1. To satisfy the institution's fiduciary responsibility to its funding sources

2. To report to the decision maker, who has allocated scarce resources, his progress in adhering to his original budget.

Another, but secondary, purpose is the classification of costs by activities and objectives (functional classification); however, the emphasis is on insuring that funds are being spent in accordance with the restrictions of those providing the funds, thus meeting the institution's fiduciary responsibilities, In other words, the typical system is designed to provide an efficient means of reporting expenditures to those entities providing funds and, at the same time, account for expenditures on the basis of the activity supported by attaching identifying codes for such "functions" as instruction, research, general administration, and student services.

A distinction should be made between cost accounting and cost finding (as reflected in the Cost Finding Principles Project). Cost accounting applies the principles of accounting in the determination of unit costs of production and promptly provides management with unit cost information that can be used to interpret expenditures incurred in the operation of the business. Cost finding, on the other hand, is required in institutions where unit cost data are not already a by-product and available through the ordinary accounting operations of the organization. The cost finding process requires that the cost finder analyze accounting data as well as other data available within the institution in order to identify and to allocate all costs of activities conducted by the institution.

Statistical Data Elements

While the institutional accounting system is the primary source of data for the Cost Finding Principles Project, several other types of data may be required to complete the cost finding process.

Among these types of data are:

1. Student data
    - a. Credit hours
    - b. Contact hours
2. Facilities data
    - a. Inventory data
    - b. Utilization data
3. Employee data
    - a. FTE employees
    - b. FTE faculty
4. Budget data
    - a. Total budget
    - b. Total operating expense

Each of these data types as well as others that may be available, such as library utilization, will be used in the Cost Finding Principles Project as the allocation parameters necessary for allocating support program costs to appropriate cost centers.[11]

Chapter IV

A PROGRAM CLASSIFICATION STRUCTURE (PCS)

PCS and the Cost Finding Principles Project

The functional and organizational classifications found in the accounting system do not provide the detail needed for the Cost Finding Principles Project. The existing accounting system emphasizes the stewardship aspect of fund accounting and does not give the cost in terms of total resources utilized; for example, it includes capital expenditures and transfer payments but does not contain depreciation costs. In addition, the primary functions do not reflect the cost of support functions and thus the full cost of the primary activities is not provided.

Since academic departments are involved in markedly different activities, they are not useful cost centers for cost study purposes, (e.g., a microbiology academic department would contain the quite different costs of providing instruction at the Ph.D. level, as opposed to the cost of providing instruction at the lower division level).

Costs need to be grouped in a classification system (i.e., cost aggregation structure) that identifies and categorizes the activities of higher education institutions at a level of detail that results in cost centers that contain relatively homogeneous activities.

The Program Classification Structure (PCS),[12] developed by the National Center for Higher Education Management Systems (NCHEMS), expands upon the functional classification found in present accounting systems and provides a format to include the detail necessary for cost analysis. (See Appendix B for a more detailed description of the Structure.)

Programs and Program Elements

For the purposes of the Program Classification Structure, a program can be considered a set of program elements serving a common objective. The assignment of program elements to programs is based on the "primary intent" of the program element (i.e., the basic purpose or major reason for establishing and maintaining the program element). Programs are structured so that program elements that produce similar outputs are included within the same program.

For these purposes, a program element may be thought of as a collection of resources, technologies, and policies that, through their integrated operation, produce goods or services, i.e., an output that is of value to the organization because it contributes to the achievement of an institutional objective. The program element represents the smallest unique collection of resources that are output-producing activities. An instructional course is an example of a program element. For instance, Introductory Physics is:

1. A collection of resources and technologies (e.g., faculty, technicians, labs, and equipment)

2. integrated through a series of activities (e.g., lectures, labs, discussion sessions)
3. in a manner defined by a set of policies (e.g., lecture outline, lab manual, text);
4. to produce a specific output (e.g., an increased level of knowledge of the basic principles of physics for one or more students)
5. that contributes to an institutional objective (e.g., provide knowledge and learning).

Primary and Support Programs

The Program Classification Structure groups campus programs into two major types: primary programs and support programs. The primary programs contain the activities directly related to the accomplishment of the primary missions of the institution (e.g., instruction, research, and public service). Support programs contain those activities that are necessary or vital for the successful operation of the primary programs. Support programs have been structured in a manner that facilitates the allocation of their costs to the primary programs.

The traditional functions of higher education have been retained in the Program Classification Structure: Instruction, Research, and Public Service are classified as Primary Programs. Libraries, Administration, and Student services are considered part of the Support Programs. Following is a list of major programs used in the Program Classification Structure. (See Figure 2, page 28.)

Primary Programs

Code	
1	Instruction Program
2	Organized Research Program
3	Public Service Program

Support Programs

Code	
4	Academic Support Program
5	Student Service Program
6	Institutional Support Program
7	Independent Operations Program

Institutions of higher education obviously have certain objectives in common. Basic to all institutions of higher education is that they offer some form of postsecondary instruction and most institutions award degrees or certificates as an indicator of the level of proficiency achieved by the student. Thus, instruction leading toward a formal degree or certificate appears to be a primary objective common to most institutions of higher education. The *instruction program* consists of those program elements whose outputs are primarily eligible for credit in meeting specified formal curricular requirements, leading toward a particular degree or certificate granted by the institution.

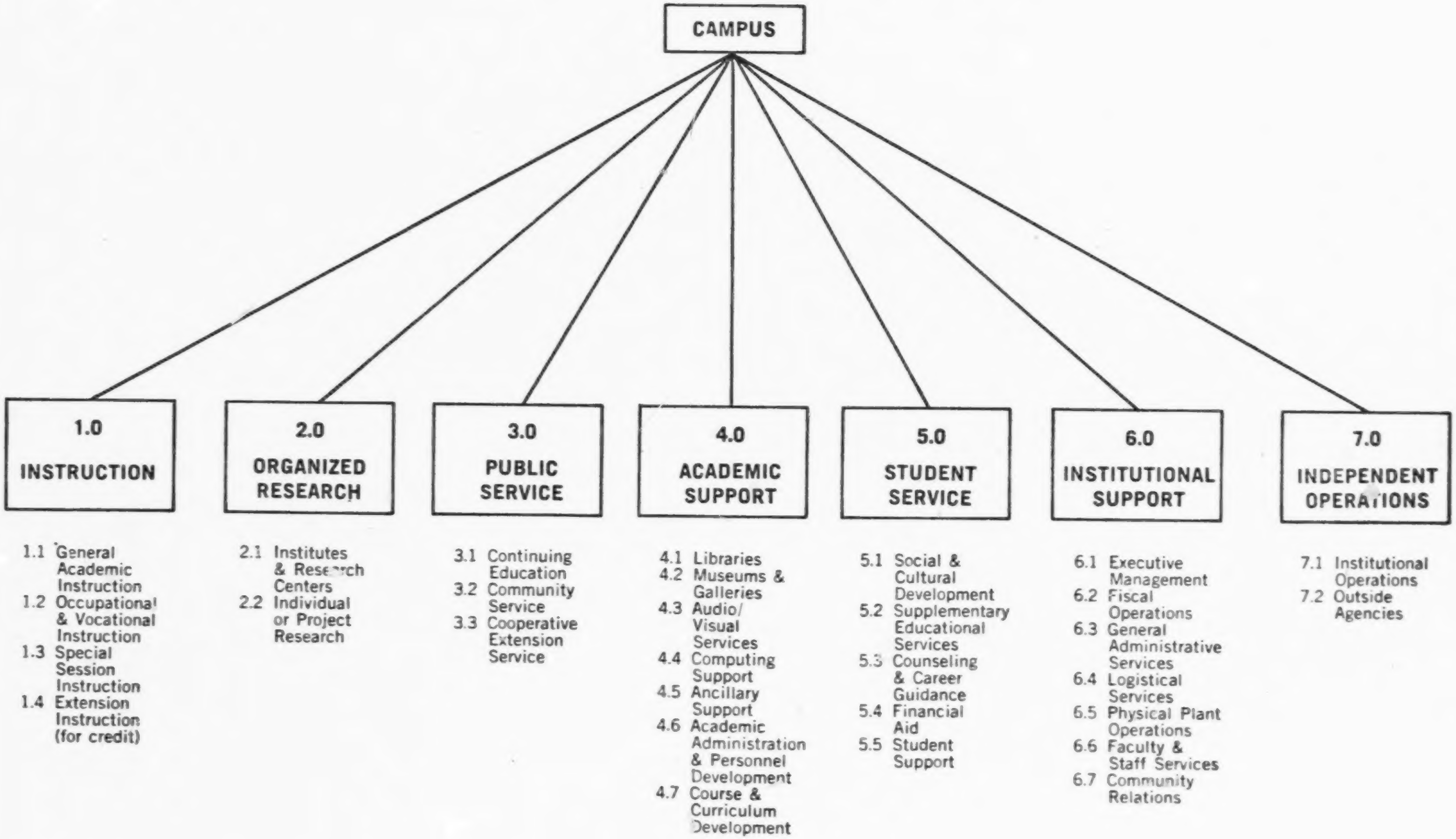


Figure 2 . Organization of the Program Classification Structure

CAMPUS
1.0 INSTRUCTION
1.1 General Academic Instruction
1.2 Occupational & Vocational Instruction
1.3 Special Session Instruction
1.4 Extension Instruction (for credit)
2.0 ORGANIZED RESEARCH
2.1 Institutes & Research Centers
2.2 Individual or Project Research
3.0 PUBLIC SERVICE
3.1 Continuing Education
3.2 Community Service
3.3 Cooperative Extension Service
4.0 ACADEMIC SUPPORT
4.1 Libraries
4.2 Museums & Galleries
4.3 Audio/Visual Services
4.4 Computing Support
4.5 Ancillary Support
4.6 Academic Administration & Personnel Development
4.7 Course & Curriculum Development
5.0 STUDENT SERVICE
5.1 Social & Cultural Development
5.2 Supplementary Educational Services
5.3 Counseling & Career Guidance
5.4 Financial Aid
5.5 Student Support
6.0 INSTITUTIONAL SUPPORT
6.1 Executive Management
6.2 Fiscal Operations
6.3 General Administrative Services
6.4 Logistical Services
6.5 Physical Plant Operations
6.6 Faculty & Staff Services
6.7 Community Relations
7.0 INDEPENDENT OPERATIONS
7.1 Institutional Operations
7.2 Outside Agencies

In addition to the instruction program, many institutions allocate a significant portion of their resources in support of research activities. The primary objective of an *organized research program* is the creation and dissemination of new knowledge. It consists of program elements that have been specifically organized to produce research outcomes either commissioned by an agency external to the institution or authorized by an organizational unit within the institution.

Institutions conducting organized research may choose to engage only in projects that also contribute to the achievement of other objectives, e.g., the graduate instruction program. One of the major spillover benefits of the organized research program, therefore, is the opportunity it provides for research activities that are essential to high quality graduate instruction and faculty development. The existence of these spillover benefits may have important cost-reducing effects on the instructional program. Nevertheless, despite these interactions, the organized research activities should be identified as distinct programs since the primary intent of the research activities is the achievement of research outcomes (new knowledge) specified by the commissioning agency or internally. It should be recognized that the "primary intent" principle, while useful as an initial test for classifying program elements, should not preclude institutional analysis or special studies to determine more explicitly the joint contribution to products. (See Appendix D on faculty activity analysis.) This is of particular concern in the area of organized research where there may be significant joint contribution to both instruction and research objectives.

Many institutions of higher education provide services to clientele external to the institution, i.e., the general public. Public service program elements are established to make available to the public the various unique resources and capabilities of the institution. The objective of a *public service program* is to provide such services as continuing education that are beneficial to groups external to the institution. Such benefits may be cultural or economic and may be directed toward individuals, common interest groups, or larger communities.

Typically, institutions establish program elements to provide services that are vital to the processes of the primary programs. The objectives of the *academic support program* are to provide support services that are an integral part of the operations of the primary programs. These are defined as the preservation, maintenance, and display of the current stock of knowledge (i.e., libraries, museums and galleries), the provision of various services and capabilities for the primary programs (i.e., audio visual, computing, and ancillary support), academic administration, and course and curriculum development.

The overall objective of a *student service program* is to contribute to the student's emotional and physical well-being and his intellectual, cultural, and social development, such as intramural athletics, outside the context of the formal academic program. The student service program attempts to achieve this overall objective by: (a) enhancing the student's effectiveness as a student; (b) expanding the dimensions of the student's educational experience; and (c) providing the necessities and conveniences for the physical and emotional well-being of students.

In higher education, as in any organized system, program elements have been established to provide those services that are necessary to maintain and sustain the organization, such as physical plant operations. The *institutional support program* consists of program elements that provide operational support for the day-to-day functioning of the organization. The overall objective of the institutional support program is to maintain the institution's organizational effectiveness and continuity. It does this by: (a) providing planning and executive direction; (b) providing efficient administrative and logistical services; (c) maintaining the quality of the physical environment; (d) enhancing relationships with the institution's constituencies; and (3) providing necessities and conveniences for faculty and staff.

In addition to the above programs, colleges and universities often engage in activities that are independent of the existence of an institution of higher education. The *independent operations program* is established to collect those program elements that may be viewed as not related directly to the objectives of an institution of higher education.

Chapter V

PRELIMINARY COST AGGREGATION STRUCTURE

The Program Classification Structure will be used as the basis for the establishment of the Cost Finding Principles cost aggregation structure. This will be done by aggregating the activities in the various programs of the PCS to levels that result in cost centers that contain relatively homogeneous activities. The preliminary cost aggregation structure that follows will be tested at the pilot institutions in order to determine the appropriate level of detail within the PCS needed for cost finding purposes.

Note: The cost centers are listed in reverse numerical order to facilitate the use of the recursive allocation technique described in Chapter VII.

Cost Center Code	Cost Center Name
*0.0.XXXX	Central Administration-Multicampus
6.7.8185	Development
6.7.8180	Community Relations
6.7.8175	Alumni Relations
6.6.7340	Faculty Retail Services
6.6.7330	Faculty Housing Service
6.6.7320	Faculty Health Service
6.6.7310	Faculty Food Service
**6.5.9699	Facility Rental
**6.5.9698	Depreciation for Equipment
**6.5.8900	Depreciation for Buildings
6.5.8430	Landscaping + Grounds Modification
6.5.8420	Facility remodeling
6.5.8340	Custodial Services
6.5.8330	Grounds Maintenance
6.5.8320	Building Maintenance
6.5.8310	Utilities
6.4.8260	Transportation Services
6.4.8253	Printing & Reproduction

*XXXX refers to the functional codings listed under PCS program 6.0, Institutional Support.

**A cost center created temporarily to accumulate costs that ultimately will be allocated to other cost centers. There is no corresponding program subcategory in the PCS.

Cost Center Code	Cost Center Name
6.4.8252	Telephone & Telegraph
6.4.8251	Mail & Distribution
6.4.8240	Purchasing & Matls.
6.4.8170	Environmental Health & Safety
*6.3.9699	Fringe Benefits
6.3.8230	Employee Personnel & Records
6.3.8220	Student Admissions and Records
6.3.8165	Space Management
6.3.8160	Administrative Support
6.2.8210	Financial Operations
6.2.8150	Investments
6.2.8140	Fiscal Control
6.1.8190	Institutional Membership Dues
6.1.8130	Legal Services
6.1.8120	Planning & Programming
6.1.8110	Executive Direction
5.5.7400	Special Student Services
5.5.7340	Student Retail Services
5.5.7330	Student Housing Service
5.5.7320	Student Health Service

*A cost center created temporarily to accumulate costs that ultimately will be allocated to other cost centers. There is no corresponding program subcategory in the PCS.

Cost Center Code	Cost Center Name
5.5.7310	Student Food Services
5.4	STUDENT FINANCIAL AID SUBPROGRAM
5.4.0000	Central unit that services all disciplines
5.4.00xx	Centrally provided service (00) disaggregated by functions (xx)
5.4.xx00	All functions (00) related to a HEGIS discipline category (xx)
5.4.xx50	Financial Analysis and Counselling
5.4.xx70	File Maintenance and Records Preparation
5.4.9500	Other Student Financial Aid
5.3	COUNSELING AND CAREER GUIDANCE SUBPROGRAM
5.3.0000	Central unit that services all disciplines
5.3.00xx	Centrally provided service (00) disaggregated by functions (xx)
5.3.xx00	All functions (00) related to a HEGIS discipline category (xx)
5.3.xx50	Student Personnel Counseling (including disciplinary counseling)
5.3.xx60	Career Guidance Service (including vocational testing)
5.3.xx70	Placement Service
5.3.9500	Other Student Counseling and Career Guidance
5.2	SUPPLEMENTARY EDUCATIONAL SERVICE SUBPROGRAM
5.2.0000	Central unit that services all disciplines
5.2.00xx	Centrally provided service (00) disaggregated by functions (xx)

Cost Center Code	Cost Center Name
5.2.xx00	All functions (00) related to a HEGIS discipline category (xx)
5.2.xx50	Tutorially organized individual education assistance in a specified discipline; e.g., statistics, chemistry
5.2.xx60	Preparatory--Prehigher education instruction provided to matriculated students
5.2.xx70	Short courses for matriculated students, e.g., FORTRAN programming, speed reading
5.2.xx80	Cooperative student learning (e.g., free university)
5.2.9500	Other Supplementary Educational Service
5.1	SOCIAL AND CULTURAL DEVELOPMENT SUBPROGRAM
5.1.7200	Intercollegiate Athletics
5.1.7100	Student Development
5.0.0000	Dean of Students
4.7.xxxx	COURSE AND CURRICULUM DEVELOPMENT SUBPROGRAM (by HEGIS discipline subcategory)
4.6.xxxx	ACADEMIC ADMINISTRATION AND PERSONNEL DEVELOPMENT SUBPROGRAM (by HEGIS discipline subcategory)
4.5	ANCILLARY SUPPORT SUBPROGRAM
4.5.0000	Central unit that services all disciplines
4.5.01xx	Agriculture and Natural Resources
4.5.02xx	Architecture and Environmental Design
.	
.	
.	
4.5.08xx	Education (e.g., laboratory school)
.	
.	
.	
4.5.12XX	Health Professions (e.g., teaching hospital)

Cost Center Code	Cost Center Name
4.5.55xx	Public Service Related Technologies
.	
.	
.	
4.5.9400	Other Ancillary Support
4.4	COMPUTING SUPPORT SUBPROGRAM
4.4.0000	Central unit that services all disciplines (e.g., one central computer center)
4.4.00xx	Centrally provided service (00) disaggregated by functions (xx)
4.4.xx00	All functions (00) related to a HEGIS discipline category (xx)
4.4.xx50	Computer Center Administration
4.4.xx60	Systems Maintenance and Development (Hardware and Software)
4.4.xx70	Systems Analysis and Programming Support (user oriented)
4.4.xx80	Computer Operations
4.4.xx90	Data Preparation
4.4.9400	Other Computing Support
4.3	AUDIO VISUAL SERVICES SUBPROGRAM
4.3.0000	Central unit that services all disciplines (e.g., one central library)
4.3.00xx	Centrally provided service (00) disaggregated by functions (xx)
4.3.xx00	All functions (00) related to the HEGIS discipline category (xx)
4.3.xx50	Management/Administration

Cost Center Code	Cost Center Name
4.3.xx60	General Support Operations e.g., Acquisitions Binding and Mending Cataloging Circulation Loan and Rental Services Reference and Information Services Reserve Shipping and Receiving
4.3.xx70	General Production Services e.g., Art Audio Displays and Exhibits Material Preparation Motion Pictures Still Photo Television and Video
4.3.xx80	Special and Named Collection
4.3.9400	Other Audio Visual Services
4.2	MUSEUMS AND GALLERIES SUBPROGRAM
4.2.0000	Central unit that services all disciplines (e.g., one central library)
4.2.00xx	Centrally provided service (00) disaggregated by functions (xx)
4.2.xx00	All functions (00) related to the HEGIS discipline category (xx)
4.2.xx50	Management/Administration
4.2.xx60	General Support Operations e.g., Acquisitions Binding and Mending Cataloging Circulation Loan and Rental Services Reference and Information Services Reserve Shipping and Receiving

Cost Center Code	Cost Center Name
4.2.xx70	General Production Services e.g., Art Audio Displays and Exhibits Material Preparation Motion Pictures Still Photo Television and Video
4.2.xx80	Special and Named Collection
4.2.9400	Other Museums and Galleries
4.1	LIBRARIES SUBPROGRAM
4.1.0000	Central unit that services all disciplines (e.g., one central library)
4.1.00xx	Centrally provided service (00) disaggregated by functions (xx)
4.1.xx00	All functions (00) related to the HEGIS discipline category (xx)
4.1.xx50	Management/Administration
4.1.xx60	General Support Operations e.g., Acquisitions Binding and Mending Cataloging Circulation Loan and Rental Services Reference and Information Services Reserve Shipping and Receiving
4.1.xx70	General Production Services e.g., Art Audio Displays and Exhibits Material Preparation Motion Pictures Still Photo Television and Video

Cost Center Code	Cost Center Name	Cost Center Level
4.1.xx80	Special and Named Collection	
4.1.9400	Other Libraries	
3.3.xxxx	COOPERATIVE EXTENSION SERVICE SUBPROGRAM	HEGIS Discipline Subcategory
3.2.xxxx	COMMUNITY SERVICE SUBPROGRAM	HEGIS Discipline Subcategory
3.1.xxxx	CONTINUING EDUCATION SUBPROGRAM	HEGIS Discipline Subcategory
2.2.xxxx	INDIVIDUAL OR PROJECT RESEARCH SUBPROGRAM	HEGIS Discipline Subcategory
2.1.xxxx	INSTITUTES AND RESEARCH CENTERS SUBPROGRAM	HEGIS Discipline Subcategory
1.4.xxxx.xx	EXTENSION INSTRUCTION SUBPROGRAM	Program Sector
1.3.xxxx.xx	SPECIAL SESSION INSTRUCTION SUBPROGRAM	Program Sector
1.2.xxxx.xx	OCCUPATIONAL AND VOCATIONAL INSTRUCTION SUBPROGRAM	Program Sector
1.1.xxxx.xx	GENERAL ACADEMIC INSTRUCTION SUBPROGRAM	Program Sector

Chapter VI

DISTRIBUTION OF COST CATEGORIES

The first major step in the cost finding procedures is to distribute costs to all cost centers. The purpose of these distributions is to refine the institutional accounting data in order to be able to start the allocation process. This will require adjusting the accounting expenditure data provided by the accounting system through special analyses that will be discussed in this section.

Distribution

Distribution is the process of attributing cost categories to a given activity in a manner that measures resources utilized by that activity.

It is important to note that the distribution definition used in Cost Finding Principles provides for the distribution of cost categories to all activities, including those contained in support cost centers as well as those contained in primary cost centers. All costs must be lodged somewhere in the cost aggregation structure based on resource utilization prior to any consideration of allocating support cost centers. This may be done by crossing over aggregation structure (see Appendix C for details) or by relying upon statistical data or a combination of the two methods.

Cost Categories

A cost category is a class of expenses representing a type of resource utilized. The major categories of cost are defined as follows:

1. Salaries and Wages - The gross cash salary of the individual from all institutional sources before deductions or exclusions, together with all staff benefits, directly and explicitly identifiable with the individual as to dollar amount and value, e.g., employer's FICA contribution, employer's contribution to TIAA-CREF or other retirement fund, employer's share of medical, hospital, accident, or life insurance premiums, and market value of goods or services provided to an employee for personal use or consumption.
2. Supplies and Expense - All operating expenses other than salaries and wages.
3. Capital Assets - The land, buildings, and equipment owned and utilized by an institution.

Salaries and Wages

A common method for distributing salaries and wages is the faculty Activity-Assignment Analysis (FAA). Currently, the National Center for Higher Education Management Systems (NCHEMS) is developing standard procedures for analyzing faculty activities and techniques for collecting data that will serve as a foundation for the distribution of faculty resources to cost centers. The underlying concept incorporated into this FAA approach is that activities will be identified with programs in terms of their contribution to program outputs. For example, a faculty member teaching a particular course may indicate that the course-related activities contribute 90 per cent to the Instruction Program and 10 per cent to the Research Program. The outcome of the FAA project will provide guidelines and procedures that will be utilized by many institutions not only for Cost Finding Principles, but also for faculty work-load studies. A condensed version of the *Faculty Activity Analysis Procedures Manual* can be found in Appendix D. These procedures are preliminary and will be reviewed, tested, and revised by the FAA Task Force. Cost Finding Principles will incorporate any changes as they are made and will include a final version.

One of the problems in any faculty activity analysis is defining who are "faculty." NCHEMS has been engaged in an effort referred to as the Manpower Accounting Manual project.[13] The purpose of this effort is to provide a comprehensive and systematic set of categories whereby the staff assignments of an institution, including the faculty, may be identified with occupational activities and institutional programs. The current approach defines seven broad occupational activity categories that are appropriate across all institutional programs as defined by the PCS. The assignment classifications are:

1.0 Executive, Administrative, Managerial
2.0 Instructional
3.0 Professional
4.0 Technical
5.0 Office
6.0 Crafts and Trades
7.0 Service

For the purposes of the faculty activity analysis, the survey should be conducted for those who have all or some portion of their appointment classified as Instructional assignment (2.0), as defined under the assignment classification scheme. All others will be considered Noninstructional employees either in the primary programs (i.e., faculty support staff) or in the support programs.

For purposes of Cost Finding Principles, the object classification of salaries and wages is broken into expenditures for three groups of employees:

1. Those employees of the institution subject to a Faculty Activity Analysis (FAA)
2. Those employees of the institution, not subject to an FAA, who are directly associated with activities represented by the primary programs
3. Those employees of the institution, not subject to an FAA, who are directly associated with activities represented by the support programs

The following discussion gives detailed step-by-step procedures for distributing salaries and wages.

Distribution of salaries for those employees subject to an FAA

Alternative I

For those employees subject to a faculty activity analysis, their salaries and wages should be distributed to cost centers and where applicable to projects within cost centers based on the results of the faculty activity analysis.

Three steps are involved with distributing salaries and wages across cost centers and projects when all faculty are surveyed.

1. For each faculty member, develop an activity/program matrix. (See Appendix D and Figure 3, page 159.)
2. For each program classification code (Figure 3, Columns 3-9), multiply the percentage of faculty member's time by his salary. (See Table 2.)

Note: On the faculty activity survey form, the faculty member's time is allocated at the PCS subprogram level. Before the Cost Finding Analysis can be completed, it is necessary for someone to code the activities at the PCS program sector level (or program subcategory, where applicable).

3. Add the salary distributed to each cost center (e.g., General Academic Instruction - Lower Division German) from each faculty member's activity/program matrix. (See Table 3.)

FIGURE 3

FACULTY ACTIVITY AND OUTPUT SURVEY FORM

Name: Gordon Wingate
Department: German
Number: 525-48-8819
Rank: Professor

(1) Activity							(2)	Distribution of Percentage to Programs								
								(3) 1.0	(4) 2.0	(5) 3.0	(6) 4.0	(7) 5.0	(8) 6.0	(9) 7.0	(10) Joint Effects	(11)
A. Teaching Activities A.1 Formally Scheduled Teaching Activities	Course Number	Department	Section	Contact Hours Lec	Disc	Lab	Percentage of Time Devoted to Activities	Instruction Program	Organized Research Program	Public Service Program	Academic Support Program	Student Service Program	Institutional Support Program	Independent Operations Program	Programs	Percentage
	182	210	04	4			14%	14%								
	343	210	01	3			12%	12%								
	699	210	01	2			15%	10%	5%							
A.2 Contact Related Activities																
	182	210	04	4			10%	10%								
	343	210	01	3			8%	8%								
A.3 Planning, Innovating, and Programming Activities																
A.4 Informal Unscheduled Teaching Activities																
B. General Faculty Service Activities B.1 Student Oriented Service Activities German Club							10%					10%				
B.2 Colleague Oriented Service Activities																
B.3 Institution Oriented Service (Professional) Activities																
B.4 Institution Oriented Service (Miscellaneous) Activities																
C. Administrative Activities C.1 Department Administrative Activities Asst. Chairman							8%				8%					
C.2 College Administrative Activities																
C.3 Institution Administrative Activities																
D. Committee Activities D.1 Department Committee Activities																
D.2 College Committee Activities																
D.3 Institution Committee Activities Campus Planning							4%						4%			
E. Research, Scholarship, and Creative Works Activities E.1 Separately Budgeted Research & Creative Work Project Activities																
Project No. 168492							19%		19%							
Project No.																
Project No.																
E.2 Not Separately Budgeted Research & Creative Work Project Activities																
E.3 General Research, Scholarship & Creative Work Activities																
F. Extra Institutional Service Activities F.1 Public Service Activities																
F.2 Private Consulting Activities																
TOTAL							100%	54%	24%		8%	10%	4%			

Estimated Total Hours Spent in Above Activities for the Week of (________) 57

TABLE 2

Distribution of Faculty Member's Salary to Cost Centers

Cost Center Name	Cost Center Code	Salary	Percentage of time	Distributed Salary
General Academic Instruction - Lower Division German	1.1.1103.20	$16,000	14$	$ 2,240
General Academic Instruction - Upper Division German	1.1.1103.30	16,000	12%	1,920
General Academic Instruction - Graduate German	1.1.1103.50	16,000	10%	1,600
Individual or Project Research - German	2.2.1103	16,000	5%	800
General Academic Instruction - Lower Division German	1.1.1103.20	16,000	10%	1,600
General Academic Instruction - Upper Division German	1.1.1103.30	16,000	8%	1,280
Social and Cultural Development - Student Organizations	5.1.7130	16,000	10%	1,600
Academic Administration - German	4.6.1103	16,000	8%	1,280
Executive Management - Planning and Programming	6.1.8120	16,000	4%	640
Individual or Project Researcher - German	2.2.1103	16,000	19%	3,040
	Totals		100%	$16,000

TABLE 3

Cost Center Name	Cost Center Code	Salary
General Academic Instruction - Lower Division German	1.1.1103.20	$2,240
General Academic Instruction - Lower Division German	1.1.1103.20	$1,600
General Academic Instruction - Lower Division German	1.1.1103.20	Salary amounts from other Activity/Program Matrices
"	"	"
"	"	"
etc.	etc.	etc.
Total		$XXXX

The FAA Task Force will review whether sampling is possible, considering the following unique data needs of CFP:

1. CFP needs activity data at the cost center level
2. Distributing faculty salaries across programs is not only influenced by the percentage of activity contributing to each program, but is also a factor of the individual's salary. Therefore, the sample size must be large enough to provide valid average percentage contributions and a corresponding average salary.

When the FAA Task Force resolves the sampling issue, its conclusions will be incorporated into the CFP procedures.

Alternative II

For those employees subject to a faculty assignment analysis, their salaries and wages should be distributed to cost centers and where applicable to projects within cost centers based on the results of the faculty assignment analysis.

Three steps are involved in this alternative. They are the same as those found in Alternative I for distributing salaries of those subject to a faculty activity analysis, page 45.

Distribution of salaries & wages of primary program non-FAA staff

Alternative I

For those employees not subject to a faculty activity analysis who are directly associated with activities represented by the primary programs, their salaries and wages should be distributed to cost centers and where applicable to projects on the basis of a staff survey. However, only that portion of nonfaculty employee time that is in the primary programs should be distributed to cost centers on the basis of such a staff survey.

Three steps are involved with distributing these salaries and wages:

1. Conduct a staff survey that will identify staff activities with program output similar to the FAA activity/program matrix found

in the FAA section (Figure 3, page 46). In most cases the supporting staff member's supervisor should fill out the survey in order to identify accurately his contribution to cost center outputs.

2. For each program classification code found in the supporting staff member's activity/program matrix, calculate the salary distribution the same way as with those employees subject to FAA. (See Table 2 on page 47.)
3. Add the salaries distributed to each cost center from each supporting staff member's activity/program matrix. (See Table 3 on page 48.)

Alternative I would appear to be the ideal in view of the fact that it most closely represents the utilization of staff resources. However, alternatives II and III, which follow, are more manageable methods and are viable alternatives especially if it can be shown that they produce results not unlike those of alternative I at a particular institution.

Again, the question of whether a sample can be used will be considered by the FAA and CFP task forces.

Alternative II

For nonfaculty employees who are associated with activities represented by the primary programs, their salaries and wages as recorded in the institution's expenditure accounts should be accepted at the organizational unit level and distributed to cost centers and projects where applicable in the same proportion as faculty salaries were distributed by utilizing the faculty activity analysis.

However, only that portion of nonfaculty employee time associated with activities represented by the primary programs should be distributed to primary cost centers on the basis of an FAA.

Three steps are involved in allocating Noninstructional salaries and wages across programs.

1. Reclassify nonfaculty salaries and wages as recorded in the accounting system's expenditure accounts to HEGIS discipline categories independently of the PCS program and subprogram involved (see Appendix C), i.e., instruction, research, and public service costs would be aggregated by HEGIS discipline category.

TABLE 4

HEGIS Discipline Category	PCS Code		Nonfaculty Salaries & Wages
English	0.0.1501		$ 5,200
English	0.0.1501		3,700
English	0.0.1501		8,000
		Total	$16,900

2. Distribute the total nonfaculty salaries and wages calculated in step 1 above among the cost centers in proportion to the FAA salary distribution within that HEGIS discipline category.

TABLE 5

English Discipline

		1.1.1501.20	2.2.1501	3.1.1501	4.6.1501	Total
1.	FAA Salary Distribution	$8000	$6000	$4000	$2000	$20,000
2.	FAA Salary Distribution Ratio	.4	.3	.2	.1	1.0
3.	Nonfaculty Salaries and Wages Distribution ($16,900 X Row 2)	$6760	$5070	$3380	$1690	$16,900

There is some question as to whether the accounting system accurately reflects resource utilization among instruction, research, public service, academic administration, student service, etc. Through the above procedure, Nonfaculty salaries and wages within the primary programs are classified on the basis of HEGIS discipline categories and then distributed to the cost centers in the same proportion as faculty salaries were distributed by utilizing the faculty activity analysis. The assumption incorporated into this procedure is that Nonfaculty employees associated with activities represented by the primary programs contribute to the programs in the same proportion as faculty. The Cost Finding Principles Project will examine other bases of distributing non-FAA employee costs such as credit hours or contact hours, or total budget. The potential problem with this alternative becomes obvious when one tries to cost a project or course (see Chapter VIII). The Nonfaculty salaries and wages would be allocated (i.e., on an indirect basis) to each project or course burdening some unfairly, considering the diversity of faculty support utilized by different projects, (e.g., two projects in chemistry: one experimental utilizing lab technicians and one theoretical utilizing no lab technicians). For this reason, alternative II may be useful for those institutions where the number of projects is limited or where projects are not being costed.

Alternative III

For nonfaculty employees who are associated with activities represented by the primary programs (i.e., faculty support staff), their salaries and wages as recorded in the institution's expenditure accounts should be accepted and reclassified into the cost aggregation structure on the basis of the activity cross-over report. (See section on reclassifying expenditures in Appendix C.)

This alternative is useful only if the accounting system accurately reflects expenditures by account on the basis of resource utilization (i.e., does the system measure utilization in terms of program outputs?). Most accounting systems, however, fail to do this, in which case, this alternative would not be acceptable.

Two steps are involved:

1. Reclassify Nonfaculty salaries and wages from the accounting system's expenditure accounts into the cost aggregation structure by utilizing the activity crossover report. (See Appendix C.)

2. Within instruction only, distribute the discipline category totals to the level of instruction (X.X.XXXX.XX) in proportion to the FAA salary distribution within instruction for that discipline.

TABLE 6

English Discipline

	1.1.1501.20	1.1.1501.30	Total Instruction
1. FAA Salary Distribution	$18,000	$12,000	$30,000
2. FAA Salary Distribution Ratio	.6	.4	1.00
3. Noninstructional Salaries and Wages Distribution ($5,200 X Row 2)	$ 3,120	$ 2,080	$ 5,200

During Phase II, the feasibility and conditions necessary for costing classes of non-FAA faculty in the primary program and distributing their salaries and wages under the different alternatives will be tested. For example, it may be shown that laboratory technicians should be distributed as they are charged in the accounting system (i.e., Alternative III) while secretaries should be distributed in proportion to faculty salaries as determined by the FAA (i.e., Alternative II).

Distribution of salaries and wages of support program non-FAA staff

For nonfaculty employees who are associated with activities represented by the support programs, their salaries and wages as recorded in the institution's *expenditure accounts should be accepted and reclassified into the cost aggregation structure on the basis of the activity crossover report (See Appendix C.)*

Employees working in the support programs tend to be expensed in the institutional accounting system according to actual resource utilization. For example, secretaries in financial aid would be charged to the financial aid expenditure account and therefore can easily be crossed over to the appropriate cost center.

Supplies and Expenses

The ideal method for distributing supplies and expense costs to program cost centers is on the basis of a study that identifies the usage of supplies and expense in the process of producing program outputs. This, however, may be difficult and costly. Various methods for allocating supplies and expense costs need to be tested during Phase II.

Alternative I

Within the primary programs supplies and expense costs should be distributed to the cost centers based on the results of a study which identifies usage.

The nature of the study may vary, depending on the type of item and the dollar amount involved. For example, if the dollar amount is significant, travel expenses could be reviewed on a sampling basis in selected disciplines within different discipline groupings (i.e., physical sciences, humanities, etc.) by asking the traveler to state the amount attributable to given activities (i.e., instruction, research, public service, and academic administration).

The results of these studies may show that costs as recorded in the institution's expenditure account accurately reflect resource utilization. What is likely to be the case, however, is that the accounting system will accurately reflect resource utilization for some types of expenditures while for others, it may not.

Alternative II

With the primary programs supplies and expense costs should be accepted at the organizational unit level and distributed to cost centers in the same proportion that salaries were distributed by utilizing the faculty activity analysis.

Three steps are involved in this alternative. They are the same as those found in Alternative II for distributing salaries and wages of employees not subject to FAA but associated with the primary programs, page 50.

Alternative III

Within the primary programs supplies and expense costs should be accepted as recorded in the institution's expenditure accounts and reclassified into the cost aggregation structure on the basis of the activity crossover report. (See section on reclassifying expenditures in Appendix C.)

The two steps required under this alternative are the same as those found under Alternative III for handling nonfaculty employee salaries and wages. (See page 53.) As in that case, this alternative is useful only if the accounting system accurately reflects expenditures by account on the basis of resource utilization.

Within the support programs supply and expense costs should be reclassified into the cost aggregation structure on the basis of the activity crossover report. (See section on reclassifying expenditures in Appendix C.)

Capital Assets

All activities at an institution of higher learning, whether primary or support activities, are users of "capital" i.e., (1) land, (2) buildings, and (3) machinery and equipment. *Therefore, the cost of capital usage should be calculated and included as a part of the determination of the costs of activities at an institution of higher education.*

Land refers to real property and includes the building sites, parking lots, athletic fields, etc. owned and utilized by the institution. For the purposes of this project, the opportunity cost associated with the use of land will be ignored. Buildings refer to the facilities permanently affixed to the land and the remodeling of such facilities, including the associated heating systems, electrical systems, fixed equipment, sewers, sidewalks, and driveways within five feet of the building. An expense is considered remodeling when it amounts to $2,500 or more and modifies the structure of the facility. Otherwise, it is considered maintenance. Equipment includes movable items having a useful life of more than one year and costing more than a given dollar amount (e.g., institutionally defined, but no more than $500). The Cost Finding Principle Project will test the feasibility and acceptability of these lower limits.

Special problems arise with the determination and allocation of capital costs because of the multiperiod character of this factor of production; that is, the capital at an institution of higher education (i.e., buildings and equipment) yields a stream of services for more than one accounting period. The service that is provided by capital in any one period is a resource input to the educational process in the very same sense that faculty and nonacademic staff "labor" are resource inputs. In determining the costs of operation of an institution of higher education for one period, the services of faculty and staff are accounted for explicitly by wages and salaries as payment for effort contributed. With respect to the services of capital, however, a comparable flow of funds reflecting the actual value of services provided is not immediately available. The intent here is to provide a meaningful conceptual framework for the determination of the costs of capital usage and, in the absence of perfect information, to suggest alternative means for capital cost estimation.

Useful life:

"Estimating the life of a fixed asset requires consideration of both physical depreciation and obsolescence. In essence, it is the period of expected economic usefulness that governs."[14] In estimating the depreciable life of facilities, a number of problems should be considered. The type of construction (brick, ferro-concrete, frame) and the purpose of the facility should be identified. A facility constructed for scientific research in nuclear physics may become functionally obsolete faster than a classroom facility. In determining the useful life of equipment, the factor of obsolescence also must be thoroughly considered. The mean time to obsolescence of a computer should be considered faster than the mean time to obsolescence of an elevator. During Phase II, studies will be conducted to determine guidelines for useful life. Whatever technique is adopted for determining the depreciable life span for capital facilities and equipment, it should represent an acceptable trade-off between computational manageability and accuracy.

Salvage value

Salvage value, is the estimated sale, trade in, scrap or junk value that remains when an asset is no longer of any use to the institution. In practice it is a very rare occasion that a facility in an institution of higher education is sold. The more common practice is to remodel outdated facilities, thus restoring their usefulness to the institution. In this case, salvage value can be viewed as zero. In the case of equipment, salvage value can often be estimated. However, in practice, salvage value is frequently ignored; the practice is not objectionable if the values are small.

Replacement costs

Replacement costs should reflect the original value of an item in current dollars.

Replacement cost represents the cost in current dollars to produce an asset of similar quality which will serve a similar function as the original. This value may be useful for planning for future needs as well as for "pricing" negotiations. Two alternative procedures can determine cost of capital utilizing the replacement cost concept:

A. Campuswide replacement cost
B. Building-by-building replacement cost

Following is a discussion of each alternative:

A. Campuswide replacement cost:
   1. List the capital expenditures for each building by year. (See Table 7, page 61 .) The buildings to be included depend on the expected useful life of each building.

2. Total the capital costs for each year.
3. For all buildings, apply to the total column by year (see Table 7) a replacement cost factor found in an index such as the Engineering News Record Building Cost Index to update all dollars to current replacement cost. Using this index, the ratio applied to the 1921 total would be approximately 836/166.
4. Sum the current replacement costs as determined in step 3 to arrive at total capital investment expressed in current dollars.
5. Divide by the useful life expressed in years to arrive at the current annual cost of capital facilities.
6. Add the present year's cost of capital as determined in step 5 to cost center 6.5.8900.

TABLE 7

BUILDING REPLACEMENT COST (CAMPUSWIDE)

Year Constructed or Remodeled	Building					Total	Replacement Cost Index	Current Replacement Cost
	A	B	C	D	Z			
1921	$X					$X	I	$X'
1922		$X				X	I	X'
1923			$X			X	I	X'
1970		X			$X	X	I	X'
								X_T'

B. Building-by-building replacement cost:

1. List the capital expenditures for each building by year. The buildings to be included depend on the expected useful life of each building.

2. For each building, apply to the building columns (A...Z) by year a replacement cost factor found in an index such as the Engineering News Record Building Cost Index to update all dollars to current replacement cost.

3. Sum the current replacement costs as determined in step 2 for each building to arrive at total capital investment for each building expressed in current dollars.

4. Divide by the useful life expressed in years to arrive at the current annual cost of capital for each building.

5. Add the present year's cost of capital for each building as determined in step 4 to cost center 6.5.8900. 6.5.8900.00 through 6.5.8999.99 may be used to identify individual buildings.

The following procedures apply to the determination of replacement cost for equipment:

1. List equipment expenditures by type by year if possible. (See Table 8, Page 64.) During Phase II there will be a review of the feasibility and practicality of distinguishing types of equipment. Useful life is also to be determined in Phase II.

2. Apply to the total expenditures (by year) a replacement cost factor for equipment such as the index published by the U.S. Department of Labor to update all dollars to current replacement cost. Using this index, the ratio applied to the 1955 total would be approximately 775/575.

3. Sum the current replacement costs as determined in step 2 to arrive at a total equipment investment expressed in current dollars.

4. Divide by the useful life expressed in years to arrive at the current annual cost of capital equipment.

5. Add the present year's cost of capital equipment as determined in step 4 to cost center 6.5.9698.

TABLE 8

EQUIPMENT REPLACEMENT COST

Year	Equipment Expenditure	Replacement Cost Index	Current Replacement Cost
1955	$\$X$	I	$\$X'$
1956	X	I	X'
1957	X	I	X'
1958	X	I	X'
1970	X	I	X'
			$\$X'_T$

Depreciation methods

Several depreciation methods have been used for many years by the accounting profession. Those most appropriate to higher education include:

1. The straight-line method, which relates depreciation to the passage of time and applies the periodic charges equally over the life of the asset.

2. Accelerated depreciation methods, which provide for higher depreciation charges in the first years of asset usage and steadily declining depreciation charges in successive years. Such plans are based on the assumption that obsolescence or usefulness is greatest early in the life of an asset. Likewise, repair and maintenance (annual charge) is greater in later years.

Chapter VII

ALLOCATION OF SUPPORT COSTS

Through the preceding procedures all cost components should be identified and attributed to both the primary and support cost centers from accounting data adjusted as a result of special studies. In some cases, it is useful to use only this information, while in other cases the full cost of the primary activities is useful. Full cost includes not only the costs attributed to primary cost centers, but also some portion of the costs of operating support activities.

Ideally, all costs should be attributable to the primary cost centers in a manner that measures actual resource utilization. However, since practical considerations preclude attaining this conceptual ideal, support costs need to be assigned or allocated to the primary activities utilizing statistical data which serve as proxy measures of resource utilization.

Allocations should be made by using statistical data that have a high correlation with the level of services provided to the cost centers utilizing the service.

The essential consideration in the selection of the statistical data element in each instance is that it be the one best suited for assigning the cost of the donor cost center to the recipient cost center in accordance with the relative benefits derived, the traceable cause and effect relationship, or logic and reason when neither benefit nor cause and effect relationship is determinable.[15]

A preliminary list of alternative statistical data elements (i.e., allocation parameters) is included at the end of this chapter. These alternatives will be tested and analyzed during Phase II, and selection from among these alternatives will be made on the basis of validity and feasibility.

Allocation Methods

Three useful allocation methods are most commonly found in cost studies:

1. Direct
2. Recursive or step-down
3. Cross-allocation or simultaneous

Direct

The direct allocation technique is a method for apportioning the costs of support programs to primary programs based on the premise that all support program activities contribute directly and exclusively to the primary programs. The costs associated with support programs are not allocated to other support programs as an intermediary step in the direct allocation process. The direct technique is the most common because it is fairly simple to handle and yet recognizes the need to allocate support costs to all the primary activities (i.e., instruction, research, and public service).

Recursive (Step-down)

The recursive or step-down technique implies a priority ranking of the various cost centers into a high-low order with the low-order cost centers being totally distributed among the higher-order activities until zeroed out. In this step-down methodology a higher-order program is never allocated to a lower-order program. Furthermore, once a support activity has been allocated, no further allocations are made to it.

The criteria for selection of the high - low priority order are:

1. *The lower-order cost centers will be those that provide the greater amount of services to the higher-order cost centers.*
2. *The lower-order cost centers will be those that receive the lesser amount of services from the higher-order cost centers.*

In determining the priority order, a certain amount of arbitrariness must, of necessity, be injected. For example, convincing arguments could be made that the subprogram of executive management should be allocated prior to any other subprogram, since executive management provides decision-making and planning services to the entire organization. On the other hand, an equally convincing argument could be made that physical plant operations should be allocated prior to any other subprogram, since all activities of the institution require facilities and maintenance services. It should be noted that when a support cost center is being costed, the allocation priorities may cause a significant difference in the computed cost. In other words, if the full cost of a support activity is being determined under the step-down method, the amount of allocated cost identified depends on the order in which the allocations were made. During Phase II variation in the high - low order will be tested, and the task force will recommend an order.

Cross-allocation (Simultaneous)

The cross-allocation technique is much more complex and involves allocations between various related programs with no implicit high - low formal ranking among the program activities. For example, allocations might be made from physical plant operations to the president's office in proportion to the square feet utilized by the president. At the same time allocations would be made to plant operations from the president's office using some rational basis such as total budget. These allocations between program activities require that each program interrelationship be expressed as a simultaneous equation. This procedure is time consuming and lends little additional accuracy to the net results. (See Appendix A of Chapter Six, A Study of the Cost of Graduate Education.)[16]

Procedures for Direct Allocations

1. Collect the statistical data that will be used to allocate a donor cost center. The statistical data should relate to all recipient cost centers to which a donor cost center will be

allocated. Where it is impractical to collect data at this detailed level, several allocation steps may be necessary to arrive at fully allocated costs. For example, it may be difficult to collect expenditure data for the cost center, lower division German instruction, in which case it may be necessary to allocate first to German instruction and then to lower division German instruction using some other parameter such as student credit hours. During Phase II, the task force will determine which cost centers require multiple step allocations and what multiple steps and parameters are.

2. For each recipient cost center, calculate the ratio that indicates what per cent of the total of that data element applies to that cost center.

TABLE 9

Recipient Cost Center Name	Recipient Cost Center Code	Statistical Data	Ratio
Lower Division German Instruction	1.1.1103.20	132,300	.37
Lower Division English Instruction	1.1.1501.20	165,800	.48
English Research Institute	2.1.1501	52,200	.15
	Total	350,300	1.00

3. Multiply the dollar amount in the donor cost center by the ratio calculated in step 2.

TABLE 10

Recipient Cost Center Name	Recipient Cost Center Code	Ratio	Donor Cost Center (Executive Management)	Allocation
Lower Division German Instruction	1.1.1103.20	.37	$365,210	$135,127
Lower Division English Instruction	1.1.1501.20	.48	365,210	175,301
English Research Institute	2.1.1501	.15	365,210	54,782
	Total	1.00		$365,210

(NOTE: See Appendix E for more complete allocation examples.)

4. Repeat steps 1 through 3 for each donor cost center.

Procedures for Step-down Allocations

1. Collect the statistical data that will be used to allocate a donor cost center. The statistical data should relate to all recipient cost centers to which a donor cost center will be allocated. Where it is impractical to collect data at this detailed level, several allocation steps may be necessary to arrive at fully allocated costs. During Phase II, the task force will determine which cost centers require multiple step allocations and what these multiple steps and parameters are.

2. Allocate one donor cost center at a time, selecting the lowest-order cost center not yet allocated.

3. For each recipient cost center calculate the ratio that indicates what per cent of the total of that data element applies to that cost center.

TABLE 11

Recipient Cost Center Name	Recipient Cost Center Code	Statistical Data	Ratio
Student Admissions and Records	6.3.8220	62,300	.10
Student Food Services	5.5.7310	210,000	.34
Lower Division German Instruction	1.1.1103.20	132,300	.21
Lower Division English Instruction	1.1.1501.20	165,800	.27
English Research Institute	2.1.1501	52,200	.08
	Total	622,600	1.00

4. Multiply the dollar amount in the donor cost center by the ratio calculated in step 3.

TABLE 12

Recipient Cost Center Name	Recipient Cost Center Code	Ratio	Donor Cost Center (Executive Management)	Allocation
Student Admissions and Records	6.3.8220	.10	$365,210	$ 36,521
Student Food Services	5.5.7310	.34	365,210	124,172
Lower Division German Instruction	1.1.1103.20	.21	365,210	76,694
Lower Division English Instruction	1.1.1501.20	.27	365,210	98,607
English Research Institute	2.1.1501	.08	365,210	29,216
	Total	1.00		$ 365,210

5. Repeat steps 1 through 4 for each donor cost center.

Student Support Cost Centers

The cost of student support programs such as student housing and student food service will include an allocation from the institutional support cost centers (6.X.XXXX) under the recursive allocation technique. This is a logical approach since in most cases these student support cost centers do receive service from institutional support cost centers such as executive management, physical plant, purchasing, etc. If the student support program is an integral part of a primary program (e.g., instruction), the associated costs should be further allocated. If, however, the support program provides supplementary services its costs should not be further allocated, but instead should be expressed as a cost per student served.

Following is a suggested high - low priority ranking with several possible allocation parameters identified for each support cost center.

HIGH-LOW PRIORITY AND POSSIBLE PARAMETERS

Cost Center Code	Cost Center Name	Possible Parameter
*0.0.XXXX	Central Administration-Multicampus	Total Budget
		Total Operating Expense
		Total Salaries
		Total FTE Employees
6.7.8185	Development	Total Salaries
		Total Budget
		Total Operating Expense
		FTE Employees
		Total Students
6.7.8180	Community Relations	Total Budget
		Total Operating Expense
		FTE Employees
		Total Students
6.7.8175	Alumni Relations	No. of Alumni by Department
		Total Students
		Contact Hours
		Credit Hours
		FTE Employees
		FTE Faculty
		Total Budget
		Total Operating Expense

*XXXX refers to the functional codings listed under PCS program 6.0, Institutional Support.

Cost Center Code	Cost Center Name	Possible Parameter
6.6.7340	Faculty Retail Services	Actual User Population Estimated User Population Target Population FTE Employees FTE Faculty Total Salaries Total Budget Total Operating Expense
6.67330	Faculty Housing Services	Actual User Population Estimated User Population Target Population FTE Employees FTE Faculty Total Salaries Total Budget Total Operating Expense
6.6.7320	Faculty Health Services	Actual User Population Estimated User Population Target Population FTE Employees FTE Faculty Total Salaries Total Budget Total Operating Expense

Cost Center Code	Cost Center Name	Possible Parameter
6.6.7310	Faculty Food Services	Actual User Population
		Estimated User Population
		Target Populations
		FTE Employees
		FTE Faculty
		Total Salaries
		Total Budget
		Total Operating Expense
*6.5.9699	Facility Rental	Assignable Sq. Ft.
		Total Salaries
		Total Budget
		Total Operating Expense
		Total FTE Employees
*6.5.9698	Depreciation for Equipment	Assignable Sq. Ft.
		FTE Employees
		Total Operating Expense
		Total Budget
		Total Salaries
*6.5.8900	Depreciation for Buildings	Assignable Sq. Ft.
		FTE Employees
		Total Operating Expense
		Total Budget
		Total Salaries

*A cost center created temporarily to accumulate costs that ultimately will be allocated to other cost centers. There is no corresponding program subcategory in the PCS.

Cost Center Code	Cost Center Name	Possible Parameter
6.5.8430	Landscaping & Grounds Modification	Assignable Sq. Ft.
		FTE Employees
		Total Budget
		Total Salaries
6.5.8420	Facility Remodeling	Assignable Sq. Ft.
		FTE Employees
		Total Budget
		Total Salaries
6.5.8340	Custodial Services	Assignable Sq. Ft.
		FTE Employees
		Total Operating Expense
		Total Budget
		Total Salaries
6.5.8330	Grounds Maintenance	Assignable Sq. Ft.
		FTE Employees
		Total Operating Expense
		Total Budget
		Total Salaries
6.5.8320	Building Maintenance	Assignable Sq. Ft.
		FTE Employees
		Total Operating Expense
		Total Budget
		Total Salaries

Cost Center Code	Cost Center Name	Possible Parameter
6.5.8310	Utilities	Assignable Sq. Ft.
		FTE Employees
		Total Operating Expense
		Total Budget
		Total Salaries
6.4.8260	Transportation Services	Per Mile Driven
		FTE Employees
		Total Operating Expense
		Total Budget
6.4.8253	Printing & Reproduction	Actual Usage
		Estimated Usage
		Target Populations
		FTE Employees
		Total Operating Expense
		Total Budget
6.4.8252	Telephone & Telegraph	FTE Employees
		Total Operating Expense
		Total Budget
6.4.8251	Mail & Distribution	Actual Usage
		Estimated Usage
		Target Population
		FTE Employees
		Total Operating Expense
		Total Budget

Cost Center Code	Cost Center Name	Possible Parameter
6.4.8240	Purchasing & Materials	No. of Transactions
		Dollar Value of Supplies Purchased
		Total Budget
		Total Operating Expense
		FTE Employees
6.4.8170	Environment Health & Safety	Per Call
		FTE Employees
		Total Operating Expense
		Total Budget
*6.3.9699	Fringe Benefits	Total Salaries by Class of Employees
		Total Salaries
6.3.8230	Employee Personnel & Records	Benefiting Employees
		Staff
		Faculty
		Total Salaries
		Total Budget
		Total Operating Expense

*A cost center created temporarily to accumulate costs that ultimately will be allocated to other cost centers. There is no corresponding program subcategory in the PCS.

Cost Center Code	Cost Center Name	Possible Parameter
6.3.8220	Student Admissions and Records	Credit Hours
		Total Students
		Contact Hours
		FTE Faculty
		FTE Employees
		No. of Sections
		Total Budget
		Total Salaries
		Total Operating Expense
6.3.8165	Space Management	Per Room by Cost Center
		Assignable Sq. Ft.
		Total Budget
		Total Salaries
		Total Operating Expense
		FTE Employees
6.3.8160	Administrative Support	Credit Hours
		Total Students
		Contact Hours
		FTE Faculty
		FTE Employees
		Total Budget
		Total Salaries
		Total Operating Expense

Cost Center Code	Cost Center Name	Possible Parameter
6.2.8210	Financial Operations	Per Transaction
		Total Operating Expense
		Total Budget
		FTE Employees
		Total Salaries
6.2.8150	Investments	Total Budget
		Total Salaries
		Total Operating Expense
		FTE Employees
6.2.8140	Fiscal Control	Per Transaction
		Total Operating Expense
		Total Budget
		FTE Employees
		Total Salaries
6.1.8190	Institutional Membership Dues	FTE Faculty
		Total Budget
		Total Operating Expense
6.1.8130	Legal Services	Per Man Hour/Cost Center
		FTE Employees
		Total Budget
		Total Operating Expense
		Total Salaries

Cost Center Code	Cost Center Name	Possible Parameter
6.1.8120	Planning & Programming	Total Budget Total Salaries Total Operating Expense FTE Employees
6.1.8110	Executive Direction	Total Budget Total Salaries Total Operating Expense FTE Employees
5.5.7400	Special Student Services	Not allocated but expressed as a unit cost per student.
5.5.7340	Student Retail Services	Not allocated but expressed as a unit cost per student.
5.5.7330	Student Housing Service	Not allocated but expressed as a unit cost per student.
5.5.7320	Student Health Service	Not allocated but expressed as a unit cost per student.
5.5.7310	Student Food Services	Not allocated but expressed as a unit cost per student.
5.4.0000	Student Financial Aid (not including transfer payments	Total Students Contact Hours Credit Huurs Number of Sections

Cost Center Code	Cost Center Name	Possible Parameter
5.3.0000	Counseling and Career Guidance	Total Students Contact Hours Credit Hours Number of Sections
5.2.0000	Supplementary Educational Services	Not allocated but expressed as a unit cost per student.
5.1.7200	Intercollegiate Athletics	Not allocated but expressed as a unit cost per student.
5.1.7100	Student Development	Not allocated but expressed as a unit cost per student.
5.0.0000	Dean of Students	Total Students Contact Hours Credit Hours Number of Sections
4.7.0000	Course & Curriculum Development	FTE Faculty FTE Employees Total Students Credit Hours Contact Hours Total Budget Total Salaries Number of Sections

Cost Center Code	Cost Center Name	Possible Parameter
4.6.0000	Academic Administration and Personnel Development	FTE Faculty
		FTE Employees
		Total Students
		Credit Hours
		Contact Hours
		Total Budget
		Total Salaries
		Number of Sections
4.5.0000	Ancillary Support	(special analysis required)
4.4.0000	Computing Support	Actual Usage
		Estimated Usage
		Target Population
		Total Students
		Credit Hours
		Contact Hours
		FTE Faculty
		Total Budget
		FTE Employees
		Total Operating Expense
		Total Salaries

Cost Center Code	Cost Center Name	Possible Parameter
4.3.0000	Audio Visual Services	Actual Usage
		Estimated Usage
		Target Population
		Total Students
		Credit Hours
		Contact Hours
		FTE Faculty
		Total Budget
		FTE Employees
		Total Operating Expense
		Total Salaries
4.2.0000	Museums & Galleries	Total Students
		Credit Hours
		Contact Hours
		FTE Faculty
		Total Budget
		FTE Employees
		Total Operating Expense
		Total Salaries
		Per Patron

Cost Center Code	Cost Center Name	Possible Parameter
4.1.0060	Library Acquisition and Circulation	Actual Circulation
		FTE Employees, primary cost centers
		User Population
		Total Budget, primary cost centers
		Total Salaries, primary cost centers
		Total Operating Expense, primary cost centers.
4.1.0050	Library Administration	FTE Faculty
		FTE Employees
		User Population
		Total Budget
		Total Salaries
		Total Operating Expense

Chapter VIII

COSTING PROGRAM ELEMENTS AND DETERMINING AVERAGE COST

Chapters VI and VII outline a preliminary set of procedures for deriving the full cost of each primary and support cost center. The distribution procedures also provide the means for determining the cost categories of projects. The next step in the cost finding process is to determine the cost of unique program elements (e.g., a research project) and the average cost of program measures (i.e., activity indicators).

Program measures or activity indicators provide a means of identifying the cost of operations in terms of units (i.e., average cost). Under this approach (i.e., unit costing), total costs associated with specified types of units are determined and then divided by the number of units generated to arrive at the cost per unit. Unit costs cannot be applied to such types of activities as research projects that do not have homogeneous units but instead are unique cost objectives. "Project costing" would be more appropriate for these activities than unit costing. Under project costing, the total costs of individual projects would be determined through specific identification of certain costs to the projects (i.e., distributed costs) and the use of allocation techniques to allocate those costs that cannot be identified readily with the projects (i.e., allocated costs).

Project Costing

The procedures for costing a project under the "project method" are:

1. Distribute the identifiable costs to the cost categories of each project. (See Chapter VI, Distribution of Cost Categories, page 41.)

2. Aggregate the allocated support costs for the cost center that contains the project.

3. Apportion these aggregated costs to each project using a base such as salaries and wages or total cost. During Phase II, alternative bases will be tested and analyzed to determine the one that is most practical and equitable.

Unit Costing

The primary question concerned with unit costing is which program or activity measure to use. The question of which unit to use depends on the purpose for determining unit costs. For the Cost Information Exchange Project,[17] the task force will consider the advantages and disadvantages of using such unit costs as cost per credit hour, cost per degree, or cost per student for interinstitutional comparisons. For cost reimbursement contracts, the unit agreed upon by the institution and the funding agency depends on the intent of the support agreement. If, for example, the agency is sending employees to regular instructional classes, student credit hours may be the most equitable unit to measure average cost. If, however, the employees were taking refresher, noncredit courses the most appropriate unit of measure might be the student contact hour.

It should be clear at this point that the cost finding process as defined in this paper will result in costs ultimately lodged at the primary cost center level and certain student service support cost centers such as student housing and food services. After costs have been lodged at these levels, measures will be selected to express these costs in terms of units. For example, the total cost of lower division English instruction may be divided by credit hours to determine lower division English instruction cost per credit hour.

At this final step in the cost finding procedures, cost per degree can be determined by accumulating the unit costs as the student passes through the processes of the institution.

The question of how to calculate the cost per unit of measure will be examined during Phase II. The preliminary draft of a paper on unit costs of instruction may be found in Appendix F.[18]

APPENDICES

APPENDIX A

INSTITUTIONAL ACCOUNT CLASSIFICATION

APPENDIX A

INSTITUTIONAL ACCOUNTING CLASSIFICATION[1]

Current Funds Expenditures

The report of current funds expenditures includes those of both unrestricted and restricted current funds. All items of expenditures are included such as salaries, wages, and other forms of compensation; consumable supplies and materials, services, and other costs of operation; and expenditures for equipment.

Current funds expenditures generally are classified in three major categories:

Educational and General
Student Aid
Auxiliary Enterprises

At the discretion of the institution, the categories Education and General and Student Aid may be merged, with each category being subtotaled.

Expenditures for those activities and programs that are conducted primarily as community of public services may be reported under separate major heads immediately following Student Aid in the Statement of Current Funds Reviews,

---

[1] College and University Business Administration, American Council on Education, Washington, D. C., A Summary of Chapters 19 and 20.

Expenditures, and Transfers and in the Schedule of Current Funds Expenditures. *Within the major categories, current funds expenditures should be classified by function or organizational unit.* Although the statement may be expanded or supplemented to *show expenditures by object,* such classification is subordinate to the classification of expenditures by function and organizational unit.

The form of the Statement of Current Funds Expenditures provides for classification of expenditures for the entire institution. If it is the policy of an institution to charge each college or other educational unit with its proportionate share of general administration, general institutional expense, library, and physical plant expenditures in order to show the extent to which each unit is financially self-sufficient, subsidiary schedules may be prepared for the units. Nevertheless, a Statement of Current Funds Expenditures for the institution as a whole should be presented.

Educational and General

Educational and General expenditures should be classified in the following functional categories:

A. Instruction and Departmental Research

B. Organized Activities Related to Educational Departments

C. Sponsored Research

D. Other Separately Budgeted Research

E. Other Sponsored Programs

F. Extension and Public Service

G. Libraries

H. Student Services

I. Operation and Maintenance of Physical Plant

J. General Administration

K. Staff Benefits

L. General Institutional Expenses

The sequence of the items in the expenditure statement may be determined by institution; however, to achieve reasonable uniformity among the financial reports of institutions, the above order is recommended.

A. Instruction and Departmental Research. Under this title should be included all expenditures of the departments, colleges, schools, and instructional divisions of the institution. It includes compensation for deans, faculty members, secretaries, technicians, laboratory and other assistants; office expenses; laboratory and instructional expenses; other operating expenses; and expenditures for equipment.

Expenditures incurred for instructional programs for students pursuing regular courses of study leading to collegiate degrees, whether offered off-campus or on-campus under the jurisdiction of an extension department, should be included under this heading. Amounts reported here should include expenditures for research not separately budgeted or financed.

The instructional divisions--schools, colleges, and departments--may be listed in this statement, or their expenditures may be summarized here and the details reported in subsidiary statements. If the administrative organization of the institution does not provide for divisions, schools, or colleges, the departments of instruction should be listed.

Expenditures for museums should be included with expenditures of the departments of instruction which they serve. Museums organized to serve the entire institution may be shown under a separate main heading or under General Institutional Expenses. Museums which are primarily of a public service nature may be reported under Extension and Public Services.

B. Organized Activities Related to Educational Departments. This title includes the gross expenditures for the activities listed under the same title in the Statement of Current Funds Revenues. Each activity should be reported separately, and all charges applicable to their operations should be included.

C. Sponsored Research. This title includes expenditures for direct costs of research projects in accordance with the terms of grants, contracts, or other agreements, representing restricted current funds expenditures. Amounts equal to indirect cost allowances may be reported as unrestricted current funds expenditures opposite this caption, if desired, in order to equalize, for report purposes, the total revenues and expenditures for Sponsored Research. When this is done, an offsetting deduction should appear in the Statement of Current Fund Expenditures, Unrestricted, following the total for Education and General.

D. Other Separately Budgeted Research. Expenditures for research bureaus and institutes, experiment stations, and similar organizational units should be reported under this title. Some separately budgeted research programs and activities may produce revenues, for example, a bureau of economic research; others may be supported by governmental appropriations, for example, Agriculture Experiment Stations; many other activities, the expenditures of which are reported under this title, produce no revenues, nor do they receive governmental appropriations. Expenditures should be reported here for such activities and for all separately budgeted research programs, regardless of the source of financial support. The title excludes departmental research not separately budgeted or financed, which is reported under Instruction and Departmental Research.

E. Other Sponsored Programs. Here should be reported the expenditures for the same activities and programs included under this title in the schedule of revenues. Examples are training programs, training and instructional institutes, and similar activites. If desired, totals may be combined with those of expenditures for sponsored research under a title such as Sponsored Research and Other Sponsored Programs.

F. Extension and Public Service. Under this title should be included expenditures of educational and other activities designed primarily to serve the general public. If of major magnitude, individual activities may be reported separately.

G. Libraries. Under this title should be included the total expenditures for separately organized libraries, both general and departmental. The expenditures include those for salaries, wages, other operating expenses, books, subscriptions, continuations, and binding costs.

H. Student Services. Expenditures for services to students are included here. Examples are: registrar's office; admissions office; offices of the deans of students, men and women; guidance and testing programs; health service, unless it is an auxiliary enterprise; the financial aid office; and institutional subsidies to student activities.

I. Operation and Maintenance of Physical Plant. This title includes all expenses for salaries, wages, supplies, materials, other similar expenses; expenditures for equipment for the operation and maintenance of the institutional plant; and miscellaneous general services not charged elsewhere. If expenditures are charged directly (prorated) to auxiliary enterprises and organized activities relating to educational department, they should be excluded or deducted from the total included under this title. Costs of work performed by the physical plant department for organizational units should be charged to those units and not included in the total reported for Operation and Maintenance of Physical Plant.

J. General Administration. Under this title should be included all expenditures of the general executive and administrative offices serving the entire institution. Administrative expenditures chargeable directly (prorated) to auxiliary enterprises or to organized activities related to educational departments should be excluded or deducted from the total included under this title.

K. Staff Benefits. Staff benefit expenditures may be reported here or may be distributed to the accounts to which the salaries and wages of faculty and other staff members are charged. Staff benefits funded directly by governmental or other outside agencies would not be included here; however, where the total figures are material and are determinable, they should be disclosed, either in a footnote or some other manner. Amounts charged directly (prorated) to auxiliary enterprises and to organized activities related to educational departments should be excluded or deducted from the total included under this title.

L. General Institutional Expenses. This title includes other expenditures for the entire institution exclusive of libraries and physical plant operation and maintenance. Wherever possible, such items should be charged as departmental and office expenses, although practices will vary among institutions because of budget and other managerial policies.

If any expenses of this group are charged directly (prorated) to auxiliary enterprises or to organized activities relating to educational departments, they should be excluded or deducted from the total of General Institutional Expenses.

Student Aid

In this category should be reported expenditures for all forms of student aid granted from current funds. Expenditures from both unrestricted and restricted current funds are included here, the amount expended from restricted current funds being shown, also, as revenues for Student Aid. Aid to students in the forms of remission of tuition and fees and of exemption from payment of such charges should be reported under this heading as expenditures of unrestricted current funds. However, remissions of tuition and fees granted because of faculty or other staff status or connection of students should be reported as Staff Benefits, not as Student Aid.

The expense of scholarships where service is required of students receiving such payments should not be reported here, but should be shown as expenses of the departments or organizational units to which the service is rendered.

Auxiliary Enterprises

This category includes the gross expenditures of the enterprises indicated. Physical plant charges, general institutional expenses, administrative charges, and other indirect costs should be included. In the Schedule of Current Funds Expenditures (Form 16), operation of each auxiliary enterprise should be reported separately.

Unrestricted Current Funds

Funds which have been earned by, or appropriated or contributed to, a college or university free from any restrictions imposed by donors, payors, or outside agencies as to their use are unrestricted current funds. Although such funds generally are used for operating purposes, they may be designated by governing boards for other institutional uses.

Basis of Reporting

Unrestricted current funds revenues and expenditures should be accounted for on the accrual basis. Because one of the primary purposes of accounting and reporting in colleges and universities is to provide financial information to meet the needs of management, the total operating revenues and expenditures must be accumulated accurately and consistently from year to year and be disclosed in the reports. Revenues should be reported when they become due, and expenditures should include charges for materials received and services rendered even though payments for them may not be made until a subsequent fiscal period.

However, unlike accounting and reporting for commercial enterprises, it is more important that the financial statements of a college or university disclose clearly the institution's stewardship of the resources and property entrusted to it than it is to determine net profits and net worth. Therefore, it may not be necessary to accrue all revenues or to prorate all expenditures.

For example, most institutions do not accrue income from investments nor allocate to subsequent fiscal periods the cost of incurance premiums. When the revenues to be received are related directly to costs already incurred, the amounts should be accrued and reported as revenues and as receivables.

Interdepartmental Transactions. Such transactions should not be accounted for and reported as current funds revenues and expenditures since to do so would inflate the total operating figures for the institution. Certain transactions, however, should be reflected in the operating statements, such as:

1. Materials produced by a departmental activity and sold to other departments or to auxiliary enterprises; for example, the sale of milk by the dairy department to the dining halls. This transaction should be treated as revenues of the organized activity related to the dairy department and as expenditures of the food services.
2. Sales and services of auxiliary enterprises to other departments; for example, catering by the food service department for student or faculty groups, for receptions, and for the entertainment of institutional guests; and the sales to offices and instructional departments by the student store. Such transactions should be treated as revenues of the respective auxiliary enterprises and as expenditures of the offices, departments, or organizations receiving the services or materials.

Examples of interdepartmental transactions that should not be reported as institutional revenues and expenditures are:

1. Sales and services of central stores and of service departments. The transactions of such units should be handled on a revolving fund basis. Costs of materials and expenditures for personal services should be charged to the appropriate units, and credits for the services and materials furnished to using departments of the institution should be credited to the appropriate units. If a subsidy from institutional funds is authorized for the support of a central store or service department, the amount of such subsidy should be reported as an expense of the institution. If an excess of credits over charges of a service department or central store is treated as revenue of the institution, such amounts should be reported as revenues in the institutional reports. The value of services and materials obtained from service departments and central stores by offices and departments of the institution must be accounted for and reported as expenditures of those departments, just as if they had been obtained from sources outside the institution.
2. Transfers of supplies or equipment from one department to another, such as laboratory materials of the chemistry department transferred to the biology department. Such transactions should be treated as reductions in expenditures of the department transferring the materials, and as expenditures of the department receiving them.

APPENDIX B

PROGRAM CLASSIFICATION STRUCTURE

APPENDIX B

THE NATIONAL CENTER FOR HIGHER EDUCATION
MANAGEMENT SYSTEMS
(NCHEMS)
AT WICHE

Section II
PROGRAM CLASSIFICATION STRUCTURE
First Edition

Prepared by:
Warren W. Gulko

SECTION II: THE PROGRAM STRUCTURE

Introduction

A program structure is a classification system that categorizes the activities of an organization according to their relationship to the organization's objectives. Although various schemes may be used, there are certain aggregation levels that are traditionally found in program structures:

a. Program

b. Subprogram

c. Program Element

The NCHEMS Program Classification Structure has expanded the number of levels in order to provide alternative aggregation levels and multi-dimensional classifications for analytical purposes. The levels of the structure are illustrated in Figure 2.1 and described in detail on the following pages. Briefly, the organizational unit is the CAMPUS, consisting of primary programs and support programs for the purpose of associating resources with programs and outputs. PROGRAM represents the major institutional missions and related support objectives. The program objective may be described by a number of subobjectives that are represented by the SUBPROGRAM. The PROGRAM CATEGORY is an implicitly defined aggregation of program subcategories that may be used to sum related program elements across program lines. PROGRAM SUBCATEGORY represents a collection of homogeneous program elements within a program category. The PROGRAM SECTOR is included to identify the level of course for instruction program elements but is available for use in other programs at the option of the institution.

PROGRAM ELEMENT represents an activity or set of activities that contribute directly to the program objective in a measurable fashion. A program element is the primary component of the program and represents the lowest order of aggregation for data in the Program Classification Structure. The various data that comprise a program element will be referred to as program measures, i.e., the indicators and expense categories associated with a program element. Program measures serve as characteristic quantitative measures of output and resources utilized in the activities of a program element. The specific program measures to be used with the Program Classification Structure will be the subject of a separate report.

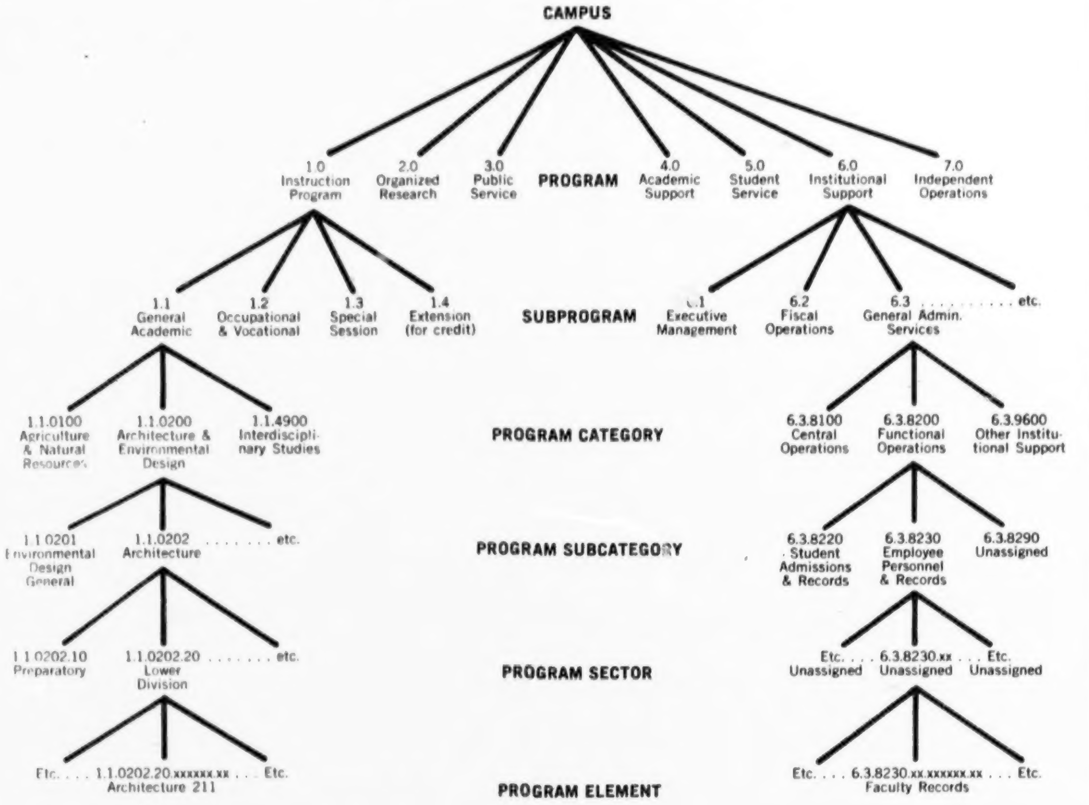


Figure 2.1. Program Classification Structure nomenclature

CAMPUS
1.0 Instruction Program
2.0 Organized Research
3.0 Public Service
PROGRAM
4.0 Academic Support
5.0 Student Service
6.0 Institutional Support
7.0 Independent Operations
1.1 General Academic
1.2 Occupational & Vocational
1.3 Special Session
1.4 Extension (for credit)
SUBPROGRAM
6.1 Executive Management
6.2 Fiscal Operations
6.3 General Admin. Services
etc.
1.1.0100 Agriculture & Natural Resources
1.1.0200 Architecture & Environmental Design
1.1.4900 Interdisciplinary Studies
PROGRAM CATEGORY
6.3.8100 Central Operations
6.3.8200 Functional Operations
6.3.9600 Other Institutional Support
1.1.0201 Environmental Design General
1.1.0202 Architecture
etc.
PROGRAM SUBCATEGORY
6.3.8220 Student Admissions & Records
6.3.8230 Employee Personnel & Records
6.3.8290 Unassigned
1.1.0202.10 Preparatory
1.1.0202.20 Lower Division
etc.
PROGRAM SECTOR
Etc. Unassigned
6.3.8230.xx Unassigned
Etc. Unassigned
Etc.
1.1.0202.20.xxxxxx.xx Architecture 211
Etc.
PROGRAM ELEMENT
Etc.
6.3.8230.xx.xxxxxx.xx Faculty Records
Etc.

Campus

Campus is the highest level of aggregation in the Program Classification Structure. Multicampus institutions and state systems may wish to develop individual, systemwide summary schemes; however, multicampus data may be processed using the Program Classification Structure. Such data may be aggregated and summarized using the unassigned right two characters of the sixteen-character coding structure to identify program elements by campus. Central office units of a multicampus system may be identified by setting the first character of the code at zero, indicating a program element which is not identified to any one campus program. An alternative is to define the central offices as a separate, pseudocampus and to identify such program elements using the unassigned right two characters of the ending structure.

Primary and Support Programs

Primary programs are those programs that contribute directly to the mission of the institution. Support programs are those programs that are adjunct to, or in direct support of, the primary programs.

Coding: Primary and support programs are implicitly defined and do not require a code.

Program

Program is an aggregation level, structuring program elements into major objectives. The Program Classification Structure is based on seven programs:

1.0 Instruction Program

2.0 Organized Research Program

3.0 Public Service Program

4.0 Academic Support Program

5.0 Student Service Program

6.0 Institutional Support Program

7.0 Independent Operations Program

Coding: Two-character numeric code; the second character defines the subprogram.

Subprogram

Subprogram is a subdivision of the program for the purpose of collecting program elements into homogeneous sets related to the subobjectives of the program. Subprograms are listed in Figure 2.3 (page 114).

Coding: One character numeric code; used in conjunction with the program code.

Program Category

Program category is a classification of similar or related program elements by discipline area or major function. The program category permits classification of program elements independent of the program or subprogram structure and may be used to aggregate functionally related program elements across program lines. Program categories for instruction program, the organized research program, and the public service program (excluding cooperative extension service) correspond to the discipline categories of the HEGIS Taxonomy. The term discipline category is used where the program category is an academic discipline which is further subdivided into discipline specialities.

Coding: Four character numeric code; the last two characters define the subcategory.

Program Subcategory

Program subcategory is a refinement of the program category and represents the principle aggregation level for collecting program elements organized to achieve or contribute to a specific set of outputs related to the program objectives. Program elements that are substitutes, i.e., produce similar outputs, should be organized within the same program subcategory. The program subcategories should be aligned with organizational entities (e.g., academic departments) or subsets of organizational entities. For the purposes of the Program Classification Structure, A Taxonomy of Instructional Programs in Higher Education (referred to as the HEGIS Taxonomy), published by the National Center for Educational Statistics has been adopted as the discipline category coding structure for primary programs. It should be noted that the HEGIS Taxonomy is addressed principally to degree programs rather than instruction discipline programs as defined by the Program Classification Structure. However, it was found that the coding of the HEGIS Taxonomy serves the purposes of this structure and was adopted in order to avoid the proliferation of coding systems.

Program subcategories for the instruction program, the organized research program, and the public service program (excluding cooperative extension service) correspond to the discipline subcategories of the HEGIS Taxonomy.

Coding: Two character numeric code; used in conjunction with the program category code.

Program Sector

Program sector refers to a subset of program elements within a program subcategory. It is designed primarily to identify the level of course for instruction program elements, e.g., lower division. Program sector may be used as a convenient identification for institutional analysis in other programs where its use is optional.

Course level refers to the level of offering for instructional courses but may be used in other programs to differentiate various student groups. The following codes are recommended for use in the instruction (1.0), and are optional for use in the organized research program (2.0), the academic support program (4.0) and the student service program (5.0), where it may be appropriate to link program elements with course levels:

1x. Preparatory

2x. Lower Division

3x. Upper Division

4x. Combined Upper Division and
Graduate or Professional

5x. Graduate or Professional Only

9x. Other

Lower division (2x) relates to course offerings at a level of comprehension usually associated with freshman and sophomore students; upper division (3x) for course offerings at a level of comprehension usually associated with junior and senior students; graduate and professional (5x) relates to postbaccalaureate offerings. Preparatory (1x) refers to noncredit course offerings or substitutes thereof (e.g., examinations) that may be required as part of the curricular requirements or preparation for degree work. Combined upper division and graduate or professional (4x) is to be used in those cases where no distinction is made between undergraduate and graduate courses. Other (9x) is a course level for those situations where the normal course levels are not appropriate. It should be noted that course levels are assigned relative to the intended degree of complexity or expected level of comprehension rather than the level of student enrolled in the course. For example, an elementary algebra course that happened to have an unusually large proportion of seniors enrolled does not become an advanced course by virtue of the participants.

The following codes are recommended for the Public Service Program (3.0):

6x. Individuals

7x. Common Interest Groups

8x. Community Sectors.

9x. Other

Individuals (6x) refers to continuing education courses offered for general clientele, i.e., individuals within the community at large. Common interest groups (7x) refers to continuing education for specific professions or special interest groups. Community sectors (8x) are the public service activities directed at particular sectors or subgroups of the community.

Coding: Two character numeric code. The first character is reserved for the above codes, the second character is unassigned.

Program sector coding is unassigned for the institutional support program (6.0), and the independent operations program (7.0).

Program Element

The lowest level of aggregation is the program element, a collection of resources, technologies, and policies integrated through a set of activities to contribute directly to the program objective in a measurable fashion. It is normally a distinct entity, separately managed or controlled, and represents the basic unit of the Program Classification Structure.

Coding: Eight character alpha-numeric code; last two characters recommended for campus identification. Program element codes are institutionally defined. Participating institutions should attempt to organize their program elements and associated coding structure in a manner that facilitates the transfer of current and future institutional data to the Program Classification Structure.

NOTE: In developing the program element code, institutions should make provisions to permit defining instruction program elements at the course or section level.

Program Measures

Associated with each program element are program measures that characterize the program element. They are the indicators of resource utilization and output associated with the activities of the program elements. Although presently undefined, it is planned that the program measures will reflect quantitative measures of the following:

a. Resources

b. Activities

c. Outputs

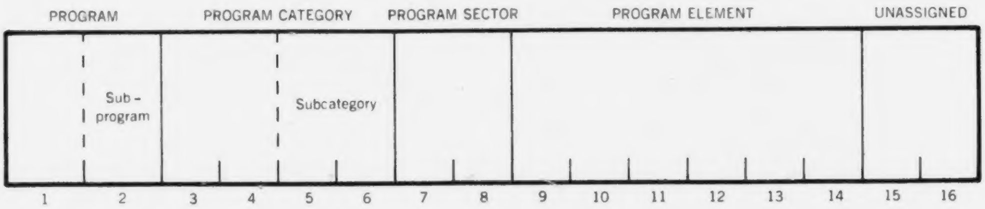
d. Performance

Program measures will be designed to allow a linkage to the regular account structure in order that program elements may be identified with organizational units and the institution's chart of accounts. In addition, program measures will permit alternative aggregations of the program elements, e.g., by source of funds.

Coding

The Program Classification Structure is based on a sixteen-character code to identify each program element. Figure 2.2 displays the proposed coding scheme for the Program Classification Structure. The fields of the sixteen-character code correspond to the previously described levels of the structure. The last two characters, 15 and 16, are unassigned to allow the option of developing unique institutional reports, e.g., identifying the various campuses in a multicampus system, or may be used to expand the program element coding scheme.

Figure 2.2. Sixteen-character coding structure



The codes for the first eight characters are specified by the NCHEMS Program Classification Structure. The coding for the remaining eight characters, i.e., the program element codes, are institutionally defined in order that each institution may identify its program elements in a manner that facilitates a correspondence to the institution's program structure and the transformation of data from the institution's data system.

The coding structure has been designed to permit the entry of program elements at various levels within the structure. Normally, a program element is identified to a specific program subcategory. However, occasionally it is not appropriate to assign a program element specifically to one program subcategory, but rather to some higher level within the structure. In these cases, the coding scheme allows for zero entries in order that program elements may be included at a level of aggregation appropriate to the particular program element. For example, consider a program element for the management and administration of a major organizational unit, e.g., the Dean of Summer Session. Suppose this program element is appropriately identified only with the special session instruction subprogram (1.3). For this case, the program element may be coded using 0000 for the program category code, which would permit the program element to be assigned to the subprogram level; e.g.,

1.3.0000.00.xxxxxx xx

The zero entries indicate that this program element is associated with all sectors (.00.) and all program subcategories (.0000) within the special session instruction subprogram.

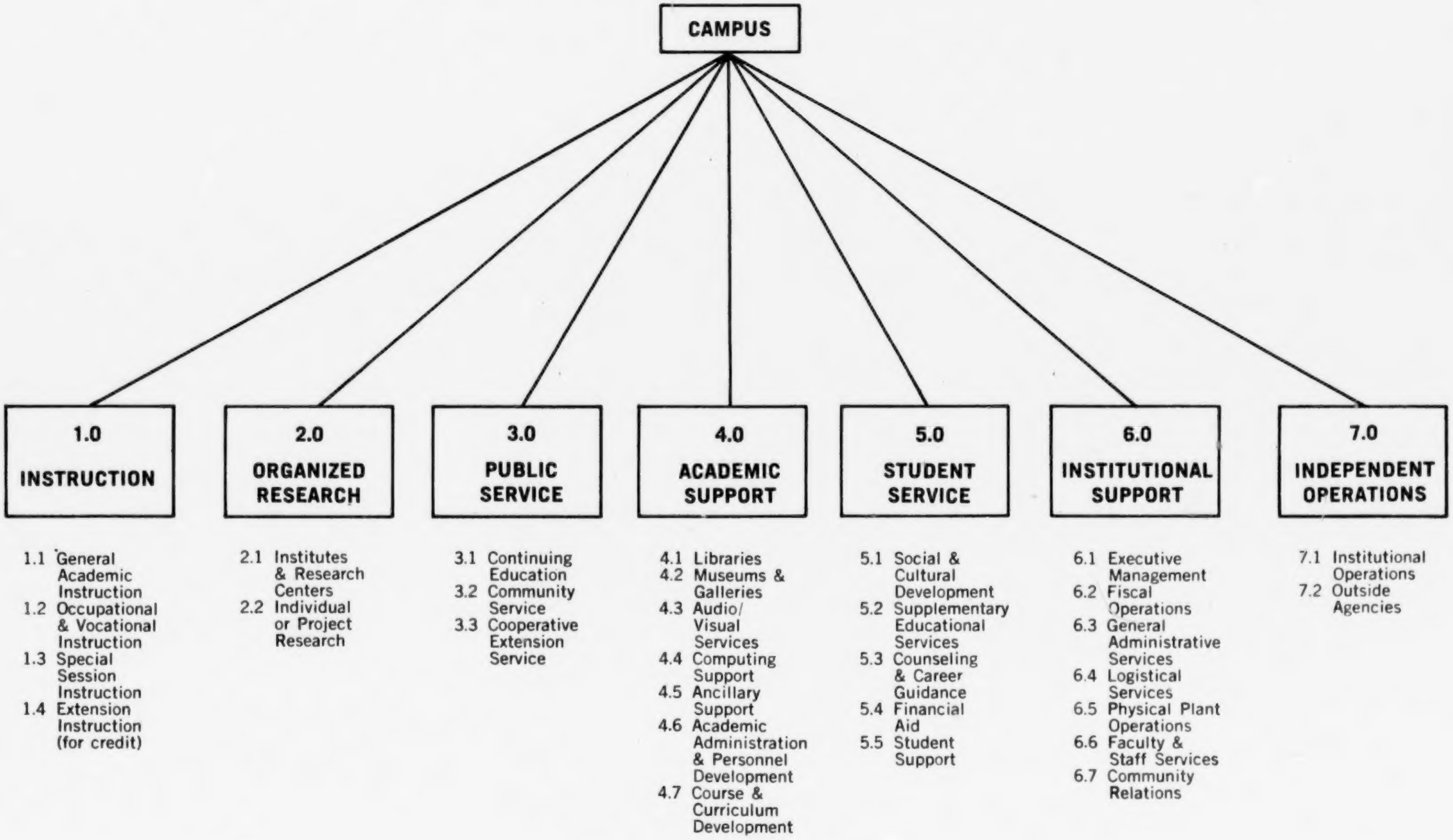
The provision for a zero entry permits program elements to be entered at the campus level, the program level, the subprogram level, or the program category level, whichever is appropriate to the specific program element. Reports will be developed to display such program elements and list them separately from the other program elements. For various applications of the Program Classification Structure, allocation procedures will be designed in a manner that will permit distributing the cost of such higher level program elements back to the appropriate program subcategories without a loss of information related to the program element.

Organization of the Structure

The Program Classification Structure has been designed to permit the aggregation of program elements in alternative ways to support various internal institutional needs. The coding scheme is suggested for use by institutions participating in the National Center for Higher Education Management Systems in order to provide the framework for comparable data exchange and the use of generalized models.

Figure 2.3 displays the organization of the Program Classification Structure to the subprogram level and the associated codes by program. The names and the coding for the primary program categories, i.e., those in instruction, organized research, and public service, are based on the HEGIS Taxonomy. The HEGIS Taxonomy has been adopted as the coding structure for use in primary program categories. The coding for support program categories is based in part on the HEGIS Taxonomy where it appears useful to identify program elements with disciplines.

Figure 2.3 Organization of the Program Classification Structure


CAMPUS
1.0 INSTRUCTION
1.1 General Academic Instruction
1.2 Occupational & Vocational Instruction
1.3 Special Session Instruction
1.4 Extension Instruction (for credit)
2.0 ORGANIZED RESEARCH
2.1 Institutes & Research Centers
2.2 Individual or Project Research
3.0 PUBLIC SERVICE
3.1 Continuing Education
3.2 Community Service
3.3 Cooperative Extension Service
4.0 ACADEMIC SUPPORT
4.1 Libraries
4.2 Museums & Galleries
4.3 Audio/Visual Services
4.4 Computing Support
4.5 Ancillary Support
4.6 Academic Administration & Personnel Development
4.7 Course & Curriculum Development
5.0 STUDENT SERVICE
5.1 Social & Cultural Development
5.2 Supplementary Educational Services
5.3 Counseling & Career Guidance
5.4 Financial Aid
5.5 Student Support
6.0 INSTITUTIONAL SUPPORT
6.1 Executive Management
6.2 Fiscal Operations
6.3 General Administrative Services
6.4 Logistical Services
6.5 Physical Plant Operations
6.6 Faculty & Staff Services
6.7 Community Relations
7.0 INDEPENDENT OPERATIONS
7.1 Institutional Operations
7.2 Outside Agencies

APPENDIX C

ACTIVITY CROSSOVER

APPENDIX C

ACTIVITY CROSSOVER

Institutional Activity Analysis/Activity Crossover

For those institutions who do not already have their current expenditure accounts coded to indicate the corresponding Program Classification Structure, it will be necessary to develop an activity crossover between their chart of accounts and the PCS. The activity crossover matches the activities supported by the expenditures from an institutional account with the same activities associated with a PCS category (PCS activities are described in Appendix B). This reclassification of institutional expenditure accounts into the Program Classification Structure requires an analysis of the purpose for which expenditures were incurred (i.e., what activities did they support).

The crossover procedure involves only two steps:

1. For each current funds expenditure account, identify the purpose or objectives of the expenditures incurred (i.e., activities supported). It is important to keep in mind that the institutional activity analysis is the sole basis for the crossover itself. The crossover involves considerably more than merely matching institutional account names, organizational unit designations,

or functional classifications with apparently similar program categories within the PCS. An individual or individuals knowledgeable about the activities performed within each organizational unit should perform a crossover based on an analysis of those activities.

2. Match the identified activities of each expenditure account with the Program Classification Structure activities at the program subcategory level, if possible. Otherwise, match at the lowest level possible. The person making this match needs to be thoroughly familiar with the Program Classification Structure.

The crossover of expenditure accounts should match PCS categories on a one-to-one basis. Several expenditure accounts may be "crossed over" to one PCS category (see sample Activity Crossover Report in Appendix C). However, expenditure accounts should not be apportioned to more than one PCS Cost Center since this could impose biases on any later allocations or distributions.

In some situations the crossover should not be done at the subcategory level. For example, Dean of Students should be crossed over at the Student Service Program level (5.0.0000) because his office tends to be supportive of the total student service program. Another example is an account that includes more than one category, such as one office handling accounting, auditing, executive direction, and purchasing. In this case, the crossover should be to the Institutional Support Program level (6.0.0000).

There may be several unusual or difficult expenditure accounts to be crossed over that are not readily apparent until the crossover is actually attempted. The following list covers some of those encountered by the nine participating institutions:[1]

1. Fellowships are generally made up of stipends to be paid to the fellow or trainee, an institutional allowance to cover tuition for the fellow or trainee, and a balance that may be spent at the discretion of the institution. The stipend portion should be crossed over to Student Financial Aid (5.4.xx90), the tuition portion to (5.4.xx91), and the remainder to instruction or research, depending on its primary use. Some institutions separate the grant funds into two or three separate accounts (i.e., one each for stipends, tuition, and the remainder) when the grant is recorded in one account, that account should be crossed over to (5.4.9500), and in a later step it should be transferred to the appropriate PCS classification based on the expenditures by the institutional accounting object codes: stipends, tuition, etc.
2. Multicampus operations generally have a central administrative function incurring expenditures that support the activities of more than one campus. The PCS is designed for a campus and, therefore, does not accommodate the central administration activity. For the Cost Finding Principles project, central administration

---

[1] Additional difficulties will be discovered in Phase II when the more complex participating institutions review and improve their preliminary crossover. These difficulties and the methods of handling them will be incorporated into a Cost Finding Principles Manual to be published at the end of Phase II.

should be crossed over to (0.0.XXXX). The XXXX classification should be the same PCS Program categories as used in other institutional support (6.0) subprograms. These categories will be allocated at a later step in the procedures.

3. Fringe benefits at many public institutions are budgeted and expensed from a central account. This account can be crossed over to (6.3.9699) until an allocation of these fringe benefits can be made.
4. Facility rental should be crossed over to (6.5.9699) whenever the institution maintains a central account for rentals. Identify the facility rental with a program subcategory, if possible.
5. Membership dues paid from a central expenditure account should be crossed over to (6.1.8190). In other cases, it will be treated as an object of expenditure and associated with various other expenditure accounts by organizational unit.

Reclassifying Expenditures

The procedures for distributing cost categories to cost centers utilize to some extent the activity crossover that was described in the previous section. In these cases, expenditure data from the institutional expenditure accounts are crossed over to PCS cost centers utilizing the activity crossover mapping. Note that the procedures for doing the activity crossover did not refer to the expenditure data. The mapping of activities is done irrespective of the expenditure amounts.

However, when the procedures for identifying direct costs call for crossing over expenditure data, certain precautions should be noted.

1. If overhead or indirect cost appears as an expenditure in the grant or contract account, that amount should not be crossed over but rather "backed out" by using the object code for indirect cost. If this were not done, costs in the amount of indirect cost reimbursement would be doubly counted. Indirect costs on grants and contracts represent reimbursement for expenditures recorded in other expenditure accounts.

2. Interdepartmental sales should be recorded as expenditures in accordance with the guidelines established in College and University Business Administration (see Appendix A). Under these guidelines, revolving funds (e.g., a central stores operation) should not have their expenditures crossed over except to the extent that they are being subsidized (i.e., expenses exceed revenue or amount charged to departments). In cases where revenue exceeds expenses, this excess should be crossed over as a negative expenditure. Sometimes, however, revenue is generated (i.e., expenditures "charged back" to the using departments) by charging the user departments on the basis of something other than usage or an accepted allocation parameter as described in the section dealing with allocations. This in effect is an allocation and needs to be corrected by:

A. "Backing out" the expenditure from the user accounts and later allocating it using the suggested parameters.

B. Correcting the "charge backs" to reflect actual usage.

3. Some institutions "cover" over-expenditures in grant and contract accounts after the termination of the grant by charging some other institutional account and recording it as a negative expenditure in the grant account. This usually results in one negative transaction for that year because it is recorded some time after the termination of all regular transactions. The problem is that this may in effect transfer an expenditure from one account that supports a grant activity, such as research, to one that may primarily support academic administration, such as the dean's office. The amounts involved, however, are small and therefore do not significantly affect total costs per programs. These negative expenditures as they appear in the grant accounts should be crossed over.

```
04/01/71                              COST FINDING PRINCIPLES
                              COST FINDING PRINCIPLES SAMPLE CROSSOVER                        PAGE    1

                                      INSTITUTION ACCOUNT NUMBER
                                                  TO
                                         PCS ACCOUNT NUMBER
                                          CROSSOVER REPORT
---------------------------------------------------------------------------------------------------------
       INSTITUTION ACCOUNT NUMBER                      INSTITUTION ACCOUNT NAME               ACCOUNT BALANCE
     100100                                 COLLEGE OF ARTS AND SCIENCES                           120,000

   PCS                  PERCENT TO           AMOUNT TO               CUM PERCENT     CUM AMOUNT            REMARKS
  ACCOUNT                ALLOCATE             ALLOCATE                 ALLOCATED       ALLOCATED
  460000                  100.000            120,000                    100.000      120,000
---------------------------------------------------------------------------------------------------------
       INSTITUTION ACCOUNT NUMBER                      INSTITUTION ACCOUNT NAME               ACCOUNT BALANCE
     100101                                 HISTORY DEPARTMENT                                     174,901

   PCS                  PERCENT TO           AMOUNT TO               CUM PERCENT     CUM AMOUNT            REMARKS
  ACCOUNT                ALLOCATE             ALLOCATE                 ALLOCATED       ALLOCATED
  112205                  100.000            174,901                    100.000      174,901
---------------------------------------------------------------------------------------------------------
       INSTITUTION ACCOUNT NUMBER                      INSTITUTION ACCOUNT NAME               ACCOUNT BALANCE
     100102                                 ENGLISH DEPARTMENT                                     196,708

   PCS                  PERCENT TO           AMOUNT TO               CUM PERCENT     CUM AMOUNT            REMARKS
  ACCOUNT                ALLOCATE             ALLOCATE                 ALLOCATED       ALLOCATED
  111501                  100.000            196,708                    100.000      196,708
---------------------------------------------------------------------------------------------------------
       INSTITUTION ACCOUNT NUMBER                      INSTITUTION ACCOUNT NAME               ACCOUNT BALANCE
     100103                                 MATHEMATICS DEPARTMENT                                  91,603

   PCS                  PERCENT TO           AMOUNT TO               CUM PERCENT     CUM AMOUNT            REMARKS
  ACCOUNT                ALLOCATE             ALLOCATE                 ALLOCATED       ALLOCATED
  111701                  100.000             91,603                    100.000       91,603
---------------------------------------------------------------------------------------------------------
       INSTITUTION ACCOUNT NUMBER                      INSTITUTION ACCOUNT NAME               ACCOUNT BALANCE
     100104                                 BIOLOGY DEPARTMENT                                     294,214

   PCS                  PERCENT TO           AMOUNT TO               CUM PERCENT     CUM AMOUNT            REMARKS
  ACCOUNT                ALLOCATE             ALLOCATE                 ALLOCATED       ALLOCATED
  110401                  100.000            294,214                    100.000      294,214
---------------------------------------------------------------------------------------------------------
       INSTITUTION ACCOUNT NUMBER                      INSTITUTION ACCOUNT NAME               ACCOUNT BALANCE
     100105                                 PHYSICAL SCIENCES DEPARTMENT                           186,369

   PCS                  PERCENT TO           AMOUNT TO               CUM PERCENT     CUM AMOUNT            REMARKS
  ACCOUNT                ALLOCATE             ALLOCATE                 ALLOCATED       ALLOCATED
  111905                  100.000            186,369                    100.000      186,369
```

```
04/01/71                               COST FINDING PRINCIPLES
                               COST FINDING PRINCIPLES SAMPLE CROSSOVER                      PAGE     2

                                          INSTITUTION ACCOUNT NUMBER
                                                      TO
                                             PCS ACCOUNT NUMBER
                                               CROSSOVER REPORT
------------------------------------------------------------------------------------------------------------
      INSTITUTION ACCOUNT NUMBER                      INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
    100200                               SCHOOL OF EDUCATION                                       44,000

  PCS                  PERCENT TO            AMOUNT TO                CUM PERCENT    CUM AMOUNT              REMARKS
  ACCOUNT               ALLOCATE              ALLOCATE                 ALLOCATED      ALLOCATED
  460800                 100.000              44,000                    100.000       44,000
------------------------------------------------------------------------------------------------------------
      INSTITUTION ACCOUNT NUMBER                      INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
    100201                               ELEMENTARY EDUCATION DEPARTMENT                          176,500

  PCS                  PERCENT TO            AMOUNT TO                CUM PERCENT    CUM AMOUNT              REMARKS
  ACCOUNT               ALLOCATE              ALLOCATE                 ALLOCATED      ALLOCATED
  110802                 100.000              176,500                   100.000       176,500
------------------------------------------------------------------------------------------------------------
      INSTITUTION ACCOUNT NUMBER                      INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
    100202                               SECONDARY EDUCATION DEPARTMENT                           192,356

  PCS                  PERCENT TO            AMOUNT TO                CUM PERCENT    CUM AMOUNT              REMARKS
  ACCOUNT               ALLOCATE              ALLOCATE                 ALLOCATED      ALLOCATED
  110803                 100.000              192,356                   100.000       192,356
------------------------------------------------------------------------------------------------------------
      INSTITUTION ACCOUNT NUMBER                      INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
    100203                               PHYSICAL EDUCATION DEPARTMENT                             63,727

  PCS                  PERCENT TO            AMOUNT TO                CUM PERCENT    CUM AMOUNT              REMARKS
  ACCOUNT               ALLOCATE              ALLOCATE                 ALLOCATED      ALLOCATED
  110835                 100.000              63,727                    100.000       63,727
------------------------------------------------------------------------------------------------------------
      INSTITUTION ACCOUNT NUMBER                      INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
    100300                               SCHOOL OF BUSINESS                                        46,200

  PCS                  PERCENT TO            AMOUNT TO                CUM PERCENT    CUM AMOUNT              REMARKS
  ACCOUNT               ALLOCATE              ALLOCATE                 ALLOCATED      ALLOCATED
  460500                 100.000              46,200                    100.000       46,200
------------------------------------------------------------------------------------------------------------
      INSTITUTION ACCOUNT NUMBER                      INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
    100301                               ACCOUNTING DEPARTMENT                                     53,629

  PCS                  PERCENT TO            AMOUNT TO                CUM PERCENT    CUM AMOUNT              REMARKS
  ACCOUNT               ALLOCATE              ALLOCATE                 ALLOCATED      ALLOCATED
  110502                 100.000              53,629                    100.000       53,629
```

```
04/01/71                                COST FINDING PRINCIPLES
                               COST FINDING PRINCIPLES SAMPLE CROSSOVER                              PAGE     3

                                          INSTITUTION ACCOUNT NUMBER
                                                      TO
                                             PCS ACCOUNT NUMBER
                                              CROSSOVER REPORT
--------------------------------------------------------------------------------------------------------------
        INSTITUTION ACCOUNT NUMBER                     INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
     100302                               ECONOMICS DEPARTMENT                                        106,678

   PCS                 PERCENT TO          AMOUNT TO                 CUM PERCENT    CUM AMOUNT                REMARKS
   ACCOUNT              ALLOCATE            ALLOCATE                  ALLOCATED      ALLOCATED
   112204                100.000            106,678                    100.000      106,678
--------------------------------------------------------------------------------------------------------------
        INSTITUTION ACCOUNT NUMBER                     INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
     100303                               MARKETING DEPARTMENT                                         56,859

   PCS                 PERCENT TO          AMOUNT TO                 CUM PERCENT    CUM AMOUNT                REMARKS
   ACCOUNT              ALLOCATE            ALLOCATE                  ALLOCATED      ALLOCATED
   110509                100.000             56,859                    100.000       56,859
--------------------------------------------------------------------------------------------------------------
        INSTITUTION ACCOUNT NUMBER                     INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
     100800                               GRADUATE SCHOOL                                              40,919

   PCS                 PERCENT TO          AMOUNT TO                 CUM PERCENT    CUM AMOUNT                REMARKS
   ACCOUNT              ALLOCATE            ALLOCATE                  ALLOCATED      ALLOCATED
   460040                100.000             40,919                    100.000       40,919
--------------------------------------------------------------------------------------------------------------
        INSTITUTION ACCOUNT NUMBER                     INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
     100900                               EXTENSION DIVISION                                          108,708

   PCS                 PERCENT TO          AMOUNT TO                 CUM PERCENT    CUM AMOUNT                REMARKS
   ACCOUNT              ALLOCATE            ALLOCATE                  ALLOCATED      ALLOCATED
   140000                100.000            108,708                    100.000      108,708
--- ----------------------------------------------------------------------------------------------------------
        INSTITUTION ACCOUNT NUMBER                     INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
     102100                               STUDENT NEWSPAPER                                            30,600

   PCS                 PERCENT TO          AMOUNT TO                 CUM PERCENT    CUM AMOUNT                REMARKS
   ACCOUNT              ALLOCATE            ALLOCATE                  ALLOCATED      ALLOCATED
   517110                100.000             30,600                    100.000       30,600
--------------------------------------------------------------------------------------------------------------
        INSTITUTION ACCOUNT NUMBER                     INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
     102200                               REMEDIAL SKILLS CENTER                                       32,550

   PCS                 PERCENT TO          AMOUNT TO                 CUM PERCENT    CUM AMOUNT                REMARKS
   ACCOUNT              ALLOCATE            ALLOCATE                  ALLOCATED      ALLOCATED
   520000                100.000             32,550                    100.000       32,550
```

```
  04/01/71                              COST FINDING PRINCIPLES                                   PAGE     4
                               COST FINDING PRINCIPLES SAMPLE CROSSOVER

                                      INSTITUTION ACCOUNT NUMBER
                                                  TO
                                          PCS ACCOUNT NUMBER
                                           CROSSOVER REPORT
--------------------------------------------------------------------------------------------------------------
       INSTITUTION ACCOUNT NUMBER                        INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
     10230001                                 CENTRAL LIBRARY-SALARIES                                 72,000

   PCS                  PERCENT TO            AMOUNT TO                CUM PERCENT     CUM AMOUNT                 REMARKS
 ACCOUNT                 ALLOCATE             ALLOCATE                  ALLOCATED        ALLOCATED
 410000                   100.000              72,000                    100.000       72,000
--------------------------------------------------------------------------------------------------------------
       INSTITUTION ACCOUNT NUMBER                        INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
     10230002                                 CENTRAL LIBRARY-WAGES                                    61,200

   PCS                  PERCENT TO            AMOUNT TO                CUM PERCENT     CUM AMOUNT                 REMARKS
 ACCOUNT                 ALLOCATE             ALLOCATE                  ALLOCATED        ALLOCATED
 410000                   100.000              61,200                    100.000       61,200
--------------------------------------------------------------------------------------------------------------
       INSTITUTION ACCOUNT NUMBER                        INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
     10230003                                 CENTRAL LIBRARY-SUPPLIES AND EXPENSES                     5,700

   PCS                  PERCENT TO            AMOUNT TO                CUM PERCENT     CUM AMOUNT                 REMARKS
 ACCOUNT                 ALLOCATE             ALLOCATE                  ALLOCATED        ALLOCATED
 410000                   100.000               5,700                    100.000        5,700
--------------------------------------------------------------------------------------------------------------
       INSTITUTION ACCOUNT NUMBER                        INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
     10230004                                 CENTRAL LIBRARY-EQUIPMENT                                 8,000

   PCS                  PERCENT TO            AMOUNT TO                CUM PERCENT     CUM AMOUNT                 REMARKS
 ACCOUNT                 ALLOCATE             ALLOCATE                  ALLOCATED        ALLOCATED
 410000                   100.000               8,000                    100.000        8,000
--------------------------------------------------------------------------------------------------------------
       INSTITUTION ACCOUNT NUMBER                        INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
     10230021                                 CENTRAL LIBRARY-COLLECTIONS                              84,100

   PCS                  PERCENT TO            AMOUNT TO                CUM PERCENT     CUM AMOUNT                 REMARKS
 ACCOUNT                 ALLOCATE             ALLOCATE                  ALLOCATED        ALLOCATED
 410000                   100.000              84,100                    100.000       84,100
--------------------------------------------------------------------------------------------------------------
       INSTITUTION ACCOUNT NUMBER                        INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
     10230022                                 CENTRAL LIBRARY-SUBSCRIPTIONS                             2,100

   PCS                  PERCENT TO            AMOUNT TO                CUM PERCENT     CUM AMOUNT                 REMARKS
 ACCOUNT                 ALLOCATE             ALLOCATE                  ALLOCATED        ALLOCATED
 410000                   100.000               2,100                    100.000        2,100
```

```
   04/01/71                          COST FINDING PRINCIPLES
                             COST FINDING PRINCIPLES SAMPLE CROSSOVER                          PAGE    5

                                    INSTITUTION ACCOUNT NUMBER
                                                TO
                                       PCS ACCOUNT NUMBER
                                         CROSSOVER REPORT
--------------------------------------------------------------------------------------------------------
       INSTITUTION ACCOUNT NUMBER                   INSTITUTION ACCOUNT NAME               ACCOUNT BALANCE
     10230023                            CENTRAL LIBRARY-BINDING                                 3,049

  PCS                 PERCENT TO         AMOUNT TO              CUM PERCENT    CUM AMOUNT              REMARKS
  ACCOUNT              ALLOCATE           ALLOCATE                ALLOCATED      ALLOCATED
  410060                100.000            3,049                   100.000     3,049
--------------------------------------------------------------------------------------------------------
       INSTITUTION ACCOUNT NUMBER                   INSTITUTION ACCOUNT NAME               ACCOUNT BALANCE
     102401                              REGISTRAR                                              32,500

  PCS                 PERCENT TO         AMOUNT TO              CUM PERCENT    CUM AMOUNT              REMARKS
  ACCOUNT              ALLOCATE           ALLOCATE                ALLOCATED      ALLOCATED
  638220                100.000            32,500                  100.000     32,500
--------------------------------------------------------------------------------------------------------
       INSTITUTION ACCOUNT NUMBER                   INSTITUTION ACCOUNT NAME               ACCOUNT BALANCE
     102402                              DEAN OF STUDENTS                                       30,300

  PCS                 PERCENT TO         AMOUNT TO              CUM PERCENT    CUM AMOUNT              REMARKS
  ACCOUNT              ALLOCATE           ALLOCATE                ALLOCATED      ALLOCATED
  500000                100.000            30,300                  100.000     30,300
--------------------------------------------------------------------------------------------------------
       INSTITUTION ACCOUNT NUMBER                   INSTITUTION ACCOUNT NAME               ACCOUNT BALANCE
     102403                              STUDENT HEALTH SERVICE                                 78,800

  PCS                 PERCENT TO         AMOUNT TO              CUM PERCENT    CUM AMOUNT              REMARKS
  ACCOUNT              ALLOCATE           ALLOCATE                ALLOCATED      ALLOCATED
  557320                100.000            78,800                  100.000     78,800
--------------------------------------------------------------------------------------------------------
       INSTITUTION ACCOUNT NUMBER                   INSTITUTION ACCOUNT NAME               ACCOUNT BALANCE
     102404                              COUNSELING CENTER                                      41,500

  PCS                 PERCENT TO         AMOUNT TO              CUM PERCENT    CUM AMOUNT              REMARKS
  ACCOUNT              ALLOCATE           ALLOCATE                ALLOCATED      ALLOCATED
  530000                100.000            41,500                  100.000     41,500
--------------------------------------------------------------------------------------------------------
       INSTITUTION ACCOUNT NUMBER                   INSTITUTION ACCOUNT NAME               ACCOUNT BALANCE
     102405                              FINANCIAL AIDS OFFICE                                  23,200

  PCS                 PERCENT TO         AMOUNT TO              CUM PERCENT    CUM AMOUNT              REMARKS
  ACCOUNT              ALLOCATE           ALLOCATE                ALLOCATED      ALLOCATED
  540000                100.000            23,200                  100.000     23,200
```

```
                                          COST FINDING PRINCIPLES
   04/01/71                     COST FINDING PRINCIPLES SAMPLE CROSSOVER                          PAGE    6

                                        INSTITUTION ACCOUNT NUMBER
                                                   TO
                                           PCS ACCOUNT NUMBER
                                            CROSSOVER REPORT
--------------------------------------------------------------------------------------------------------
        INSTITUTION ACCOUNT NUMBER                      INSTITUTION ACCOUNT NAME              ACCOUNT BALANCE
      102501                            PHYSICAL PLANT DIRECTOR                                    23,600

    PCS                  PERCENT TO            AMOUNT TO              CUM PERCENT    CUM AMOUNT              REMARKS
   ACCOUNT                ALLOCATE             ALLOCATE                ALLOCATED      ALLOCATED
   658320                  100.000               23,600                  100.000      23,600
--------------------------------------------------------------------------------------------------------
        INSTITUTION ACCOUNT NUMBER                      INSTITUTION ACCOUNT NAME              ACCOUNT BALANCE
      102502                            CUSTODIAL SERVICES                                         92,500

    PCS                  PERCENT TO            AMOUNT TO              CUM PERCENT    CUM AMOUNT              REMARKS
   ACCOUNT                ALLOCATE             ALLOCATE                ALLOCATED      ALLOCATED
   658340                  100.000               92,500                  100.000      92,500
--------------------------------------------------------------------------------------------------------
        INSTITUTION ACCOUNT NUMBER                      INSTITUTION ACCOUNT NAME              ACCOUNT BALANCE
      102503                            BUILDING MAINTENANCE                                       62,900

    PCS                  PERCENT TO            AMOUNT TO              CUM PERCENT    CUM AMOUNT              REMARKS
   ACCOUNT                ALLOCATE             ALLOCATE                ALLOCATED      ALLOCATED
   658320                  100.000               62,900                  100.000      62,900
--------------------------------------------------------------------------------------------------------
        INSTITUTION ACCOUNT NUMBER                      INSTITUTION ACCOUNT NAME              ACCOUNT BALANCE
      102504                            UTILITIES                                                  61,700

    PCS                  PERCENT TO            AMOUNT TO              CUM PERCENT    CUM AMOUNT              REMARKS
   ACCOUNT                ALLOCATE             ALLOCATE                ALLOCATED      ALLOCATED
   658310                  100.000               61,700                  100.000      61,700
--------------------------------------------------------------------------------------------------------
        INSTITUTION ACCOUNT NUMBER                      INSTITUTION ACCOUNT NAME              ACCOUNT BALANCE
      102506                            VEHICLES AND MAJOR EQUIPMENT                               42,300

    PCS                  PERCENT TO            AMOUNT TO              CUM PERCENT    CUM AMOUNT              REMARKS
   ACCOUNT                ALLOCATE             ALLOCATE                ALLOCATED      ALLOCATED
   648260                  100.000               42,300                  100.000      42,300
--------------------------------------------------------------------------------------------------------
        INSTITUTION ACCOUNT NUMBER                      INSTITUTION ACCOUNT NAME              ACCOUNT BALANCE
      102507                            POLICE AND WATCHMEN                                        31,446

    PCS                  PERCENT TO            AMOUNT TO              CUM PERCENT    CUM AMOUNT              REMARKS
   ACCOUNT                ALLOCATE             ALLOCATE                ALLOCATED      ALLOCATED
   648170                  100.000               31,446                  100.000      31,446
```

```
                                      COST FINDING PRINCIPLES
   04/01/71                     COST FINDING PRINCIPLES SAMPLE CROSSOVER                          PAGE     7

                                      INSTITUTION ACCOUNT NUMBER
                                                  TO
                                         PCS ACCOUNT NUMBER
                                          CROSSOVER REPORT
------------------------------------------------------------------------------------------------------------
          INSTITUTION ACCOUNT NUMBER                     INSTITUTION ACCOUNT NAME                  ACCOUNT BALANCE
        102508                           PROPERTY INSURANCE                                              17,280

    PCS                   PERCENT TO            AMOUNT TO                CUM PERCENT    CUM AMOUNT                REMARKS
    ACCOUNT                ALLOCATE              ALLOCATE                  ALLOCATED      ALLOCATED
    658320                 100.000               17,280                    100.000      17,280
------------------------------------------------------------------------------------------------------------
          INSTITUTION ACCOUNT NUMBER                     INSTITUTION ACCOUNT NAME                  ACCOUNT BALANCE
        102601                           GOVERNING BOARD                                                  3,600

    PCS                   PERCENT TO            AMOUNT TO                CUM PERCENT    CUM AMOUNT                REMARKS
    ACCOUNT                ALLOCATE              ALLOCATE                  ALLOCATED      ALLOCATED
    618110                 100.000                3,600                    100.000       3,600
------------------------------------------------------------------------------------------------------------
          INSTITUTION ACCOUNT NUMBER                     INSTITUTION ACCOUNT NAME                  ACCOUNT BALANCE
        102602                           PRESIDENTS OFFICE                                               46,200

    PCS                   PERCENT TO            AMOUNT TO                CUM PERCENT    CUM AMOUNT                REMARKS
    ACCOUNT                ALLOCATE              ALLOCATE                  ALLOCATED      ALLOCATED
    618110                 100.000               46,200                    100.000      46,200
------------------------------------------------------------------------------------------------------------
          INSTITUTION ACCOUNT NUMBER                     INSTITUTION ACCOUNT NAME                  ACCOUNT BALANCE
        102603                           ACADEMIC VICE-PRESIDENT                                         40,400

    PCS                   PERCENT TO            AMOUNT TO                CUM PERCENT    CUM AMOUNT                REMARKS
    ACCOUNT                ALLOCATE              ALLOCATE                  ALLOCATED      ALLOCATED
    618110                 100.000               40,400                    100.000      40,400
------------------------------------------------------------------------------------------------------------
          INSTITUTION ACCOUNT NUMBER                     INSTITUTION ACCOUNT NAME                  ACCOUNT BALANCE
        102604                           VICE PRESIDENT FOR BUSINESS AFFAIRS                             46,500

    PCS                   PERCENT TO            AMOUNT TO                CUM PERCENT    CUM AMOUNT                REMARKS
    ACCOUNT                ALLOCATE              ALLOCATE                  ALLOCATED      ALLOCATED
    618110                 100.000               46,500                    100.000      46,500
------------------------------------------------------------------------------------------------------------
          INSTITUTION ACCOUNT NUMBER                     INSTITUTION ACCOUNT NAME                  ACCOUNT BALANCE
        102605                           LEGAL COUNSEL                                                    6,750

    PCS                   PERCENT TO            AMOUNT TO                CUM PERCENT    CUM AMOUNT                REMARKS
    ACCOUNT                ALLOCATE              ALLOCATE                  ALLOCATED      ALLOCATED
    618130                 100.000                6,750                    100.000       6,750
```

```
                                          COST FINDING PRINCIPLES
 04/01/71                         COST FINDING PRINCIPLES SAMPLE CROSSOVER                          PAGE     8

                                          INSTITUTION ACCOUNT NUMBER
                                                      TO
                                             PCS ACCOUNT NUMBER
                                               CROSSOVER REPORT
------------------------------------------------------------------------------------------------------------
        INSTITUTION ACCOUNT NUMBER                   INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
      102801                              ALUMNI OFFICE                                            30,900

   PCS                 PERCENT TO          AMOUNT TO              CUM PERCENT       CUM AMOUNT           REMARKS
  ACCOUNT               ALLOCATE            ALLOCATE               ALLOCATED         ALLOCATED
  678100                 100.000             30,900                   100.000        30,900
------------------------------------------------------------------------------------------------------------
        INSTITUTION ACCOUNT NUMBER                   INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
      102802                              ACCOUNTING OFFICE                                        52,941

   PCS                 PERCENT TO          AMOUNT TO              CUM PERCENT       CUM AMOUNT           REMARKS
  ACCOUNT               ALLOCATE            ALLOCATE               ALLOCATED         ALLOCATED
  628210                 100.000             52,941                   100.000        52,941
------------------------------------------------------------------------------------------------------------
        INSTITUTION ACCOUNT NUMBER                   INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
      102803                              BULLETINS AND CATALOGUES                                 35,803

   PCS                 PERCENT TO          AMOUNT TO              CUM PERCENT       CUM AMOUNT           REMARKS
  ACCOUNT               ALLOCATE            ALLOCATE               ALLOCATED         ALLOCATED
  638220                 100.000             35,803                   100.000        35,803
------------------------------------------------------------------------------------------------------------
        INSTITUTION ACCOUNT NUMBER                   INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
      102804                              COMMENCEMENT                                              3,300

   PCS                 PERCENT TO          AMOUNT TO              CUM PERCENT       CUM AMOUNT           REMARKS
  ACCOUNT               ALLOCATE            ALLOCATE               ALLOCATED         ALLOCATED
  678100                 100.000              3,300                   100.000         3,300
------------------------------------------------------------------------------------------------------------
        INSTITUTION ACCOUNT NUMBER                   INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
      10280551                            PRINTING AND REPRODUCTION                                18,600

   PCS                 PERCENT TO          AMOUNT TO              CUM PERCENT       CUM AMOUNT           REMARKS
  ACCOUNT               ALLOCATE            ALLOCATE               ALLOCATED         ALLOCATED
  648253                 100.000             18,600                   100.000        18,600
------------------------------------------------------------------------------------------------------------
        INSTITUTION ACCOUNT NUMBER                   INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
      10280552                            MAIL AND DISTRIBUTION                                     3,460

   PCS                 PERCENT TO          AMOUNT TO              CUM PERCENT       CUM AMOUNT           REMARKS
  ACCOUNT               ALLOCATE            ALLOCATE               ALLOCATED         ALLOCATED
  648251                 100.000              3,460                   100.000         3,460
```

```
                                        COST FINDING PRINCIPLES
  04/01/71                    COST FINDING PRINCIPLES SAMPLE CROSSOVER                        PAGE     9

                                     INSTITUTION ACCOUNT NUMBER
                                                 TO
                                         PCS ACCOUNT NUMBER
                                          CROSSOVER REPORT
----------------------------------------------------------------------------------------------------------------
        INSTITUTION ACCOUNT NUMBER                      INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
      10280553                         TELEPHONE                                                      8,245

   PCS                 PERCENT TO             AMOUNT TO              CUM PERCENT       CUM AMOUNT               REMARKS
  ACCOUNT               ALLOCATE               ALLOCATE               ALLOCATED          ALLOCATED
  648252                 100.000                8,245                  100.000           8,245
----------------------------------------------------------------------------------------------------------------
        INSTITUTION ACCOUNT NUMBER                      INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
      102806                           LIABILITY INSURANCE                                            14,688

   PCS                 PERCENT TO             AMOUNT TO              CUM PERCENT       CUM AMOUNT               REMARKS
  ACCOUNT               ALLOCATE               ALLOCATE               ALLOCATED          ALLOCATED
  638160                 100.000               14,688                  100.000           14,688
----------------------------------------------------------------------------------------------------------------
        INSTITUTION ACCOUNT NUMBER                      INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
      102807                           MEMBERSHIPS                                                    16,218

   PCS                 PERCENT TO             AMOUNT TO              CUM PERCENT       CUM AMOUNT               REMARKS
  ACCOUNT               ALLOCATE               ALLOCATE               ALLOCATED          ALLOCATED
  678100                 100.000               16,218                  100.000           16,218
----------------------------------------------------------------------------------------------------------------
        INSTITUTION ACCOUNT NUMBER                      INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
      102808                           PUBLICATIONS PURCHASE AND SUBSCRIPTIONS                          860

   PCS                 PERCENT TO             AMOUNT TO              CUM PERCENT       CUM AMOUNT               REMARKS
  ACCOUNT               ALLOCATE               ALLOCATE               ALLOCATED          ALLOCATED
  678100                 100.000                  860                  100.000             860
----------------------------------------------------------------------------------------------------------------
        INSTITUTION ACCOUNT NUMBER                      INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
      102809                           PUBLIC RELATIONS OFFICE                                        24,157

   PCS                 PERCENT TO             AMOUNT TO              CUM PERCENT       CUM AMOUNT               REMARKS
  ACCOUNT               ALLOCATE               ALLOCATE               ALLOCATED          ALLOCATED
  678100                 100.000               24,157                  100.000           24,157
----------------------------------------------------------------------------------------------------------------
        INSTITUTION ACCOUNT NUMBER                      INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
      102810                           INSTITUTIONAL RESEARCH                                         35,483

   PCS                 PERCENT TO             AMOUNT TO              CUM PERCENT       CUM AMOUNT               REMARKS
  ACCOUNT               ALLOCATE               ALLOCATE               ALLOCATED          ALLOCATED
  618120                 100.000               35,483                  100.000           35,483
```

```
                                              COST FINDING PRINCIPLES
04/01/71                                COST FINDING PRINCIPLES SAMPLE CROSSOVER                              PAGE    10

                                              INSTITUTION ACCOUNT NUMBER
                                                          TO
                                                 PCS ACCOUNT NUMBER
                                                  CROSSOVER REPORT
-------------------------------------------------------------------------------------------------------------------------
       INSTITUTION ACCOUNT NUMBER                      INSTITUTION ACCOUNT NAME                     ACCOUNT BALANCE
     102811                               COMPUTING CENTER                                               238,259

   PCS                     PERCENT TO           AMOUNT TO              CUM PERCENT      CUM AMOUNT              REMARKS
  ACCOUNT                   ALLOCATE             ALLOCATE               ALLOCATED         ALLOCATED
  440000                     100.000             238,259                 100.000        238,259
-------------------------------------------------------------------------------------------------------------------------
       INSTITUTION ACCOUNT NUMBER                      INSTITUTION ACCOUNT NAME                     ACCOUNT BALANCE
     103001                               INTERCOLLEGIATE ATHLETICS                                       69,200

   PCS                     PERCENT TO           AMOUNT TO              CUM PERCENT      CUM AMOUNT              REMARKS
  ACCOUNT                   ALLOCATE             ALLOCATE               ALLOCATED         ALLOCATED
  517200                     100.000              69,200                 100.000         69,200
-------------------------------------------------------------------------------------------------------------------------
       INSTITUTION ACCOUNT NUMBER                      INSTITUTION ACCOUNT NAME                     ACCOUNT BALANCE
     103002                               RESICENCE HALLS                                                 19,900

   PCS                     PERCENT TO           AMOUNT TO              CUM PERCENT      CUM AMOUNT              REMARKS
  ACCOUNT                   ALLOCATE             ALLOCATE               ALLOCATED         ALLOCATED
  557330                     100.000              19,900                 100.000         19,900
-------------------------------------------------------------------------------------------------------------------------
       INSTITUTION ACCOUNT NUMBER                      INSTITUTION ACCOUNT NAME                     ACCOUNT BALANCE
     103003                               FOOD SERVICES                                                   17,700

   PCS                     PERCENT TO           AMOUNT TO              CUM PERCENT      CUM AMOUNT              REMARKS
  ACCOUNT                   ALLOCATE             ALLOCATE               ALLOCATED         ALLOCATED
  557310                     100.000              17,700                 100.000         17,700
-------------------------------------------------------------------------------------------------------------------------
       INSTITUTION ACCOUNT NUMBER                      INSTITUTION ACCOUNT NAME                     ACCOUNT BALANCE
     103004                               STUDENT UNION                                                   28,300

   PCS                     PERCENT TO           AMOUNT TO              CUM PERCENT      CUM AMOUNT              REMARKS
  ACCOUNT                   ALLOCATE             ALLOCATE               ALLOCATED         ALLOCATED
  517140                     100.000              28,300                 100.000         28,300
-------------------------------------------------------------------------------------------------------------------------
       INSTITUTION ACCOUNT NUMBER                      INSTITUTION ACCOUNT NAME                     ACCOUNT BALANCE
     103005                               STUDENT STORE                                                    6,850

   PCS                     PERCENT TO           AMOUNT TO              CUM PERCENT      CUM AMOUNT              REMARKS
  ACCOUNT                   ALLOCATE             ALLOCATE               ALLOCATED         ALLOCATED
  557340                     100.000               6,850                 100.000          6,850
```

```
                                        COST FINDING PRINCIPLES
    04/01/71                     COST FINDING PRINCIPLES SAMPLE CROSSOVER                      PAGE    11

                                         INSTITUTION ACCOUNT NUMBER
                                                    TO
                                            PCS ACCOUNT NUMBER
                                             CROSSOVER REPORT
-----------------------------------------------------------------------------------------------------------
        INSTITUTION ACCOUNT NUMBER                   INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
      220104                              MUTATION PROJECT                                        40,415

    PCS                 PERCENT TO        AMOUNT TO              CUM PERCENT     CUM AMOUNT             REMARKS
  ACCOUNT                ALLOCATE          ALLOCATE                ALLOCATED       ALLOCATED
  22042201                100.000           40,415                  100.000      40,415
-----------------------------------------------------------------------------------------------------------
        INSTITUTION ACCOUNT NUMBER                   INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
      230104                              WATERFOWL STUDY                                         50,000

    PCS                 PERCENT TO        AMOUNT TO              CUM PERCENT     CUM AMOUNT             REMARKS
  ACCOUNT                ALLOCATE          ALLOCATE                ALLOCATED       ALLOCATED
  22010701                100.000           50,000                  100.000      50,000
-----------------------------------------------------------------------------------------------------------
        INSTITUTION ACCOUNT NUMBER                   INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
      240308                              BUREAU OF BUSINESS RESEARCH                             51,649

    PCS                 PERCENT TO        AMOUNT TO              CUM PERCENT     CUM AMOUNT             REMARKS
  ACCOUNT                ALLOCATE          ALLOCATE                ALLOCATED       ALLOCATED
  21050101                100.000           51,649                  100.000      51,649
-----------------------------------------------------------------------------------------------------------
        INSTITUTION ACCOUNT NUMBER                   INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
      250308                              BUREAU OF BUSINESS RESEARCH                             10,900

    PCS                 PERCENT TO        AMOUNT TO              CUM PERCENT     CUM AMOUNT             REMARKS
  ACCOUNT                ALLOCATE          ALLOCATE                ALLOCATED       ALLOCATED
  21050101                100.000           10,900                  100.000      10,900
-----------------------------------------------------------------------------------------------------------
        INSTITUTION ACCOUNT NUMBER                   INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
      260100                              STERLING LECTURES                                       15,415

    PCS                 PERCENT TO        AMOUNT TO              CUM PERCENT     CUM AMOUNT             REMARKS
  ACCOUNT                ALLOCATE          ALLOCATE                ALLOCATED       ALLOCATED
  517120                  100.000           15,415                  100.000      15,415
-----------------------------------------------------------------------------------------------------------
        INSTITUTION ACCOUNT NUMBER                   INSTITUTION ACCOUNT NAME                ACCOUNT BALANCE
      270100                              EUROPEAN EXPOSURE PROGRAM                               27,550

    PCS                 PERCENT TO        AMOUNT TO              CUM PERCENT     CUM AMOUNT             REMARKS
  ACCOUNT                ALLOCATE          ALLOCATE                ALLOCATED       ALLOCATED
  520000                  100.000           27,550                  100.000      27,550
```

```
                                          COST FINDING PRINCIPLES
   04/01/71                    COST FINDING PRINCIPLES SAMPLE CROSSOVER                           PAGE    12

                                       INSTITUTION ACCOUNT NUMBER
                                                   TO
                                           PCS ACCOUNT NUMBER
                                            CROSSOVER REPORT
-----------------------------------------------------------------------------------------------------------------
      INSTITUTION ACCOUNT NUMBER                        INSTITUTION ACCOUNT NAME                 ACCOUNT BALANCE
    323001                              INTERCOLLEGIATE ATHLETICS                                     246,690

  PCS                   PERCENT TO         AMOUNT TO             CUM PERCENT    CUM AMOUNT                REMARKS
  ACCOUNT                ALLOCATE           ALLOCATE              ALLOCATED      ALLOCATED
  517200                  100.000          246,690                  100.000     246,690
-----------------------------------------------------------------------------------------------------------------
      INSTITUTION ACCOUNT NUMBER                        INSTITUTION ACCOUNT NAME                 ACCOUNT BALANCE
    333002                              RESICENCE HALLS                                               231,900

  PCS                   PERCENT TO         AMOUNT TO             CUM PERCENT    CUM AMOUNT                REMARKS
  ACCOUNT                ALLOCATE           ALLOCATE              ALLOCATED      ALLOCATED
  557330                  100.000          231,900                  100.000     231,900
-----------------------------------------------------------------------------------------------------------------
      INSTITUTION ACCOUNT NUMBER                        INSTITUTION ACCOUNT NAME                 ACCOUNT BALANCE
    343003                              FOOD SERVICES                                                 289,600

  PCS                   PERCENT TO         AMOUNT TO             CUM PERCENT    CUM AMOUNT                REMARKS
  ACCOUNT                ALLOCATE           ALLOCATE              ALLOCATED      ALLOCATED
  557310                  100.000          289,600                  100.000     289,600
-----------------------------------------------------------------------------------------------------------------
      INSTITUTION ACCOUNT NUMBER                        INSTITUTION ACCOUNT NAME                 ACCOUNT BALANCE
    353004                              STUDENT UNION                                                  23,820

  PCS                   PERCENT TO         AMOUNT TO             CUM PERCENT    CUM AMOUNT                REMARKS
  ACCOUNT                ALLOCATE           ALLOCATE              ALLOCATED      ALLOCATED
  517140                  100.000           23,820                  100.000      23,820
-----------------------------------------------------------------------------------------------------------------
      INSTITUTION ACCOUNT NUMBER                        INSTITUTION ACCOUNT NAME                 ACCOUNT BALANCE
    363005                              STUDENT STORE                                                 155,160

  PCS                   PERCENT TO         AMOUNT TO             CUM PERCENT    CUM AMOUNT                REMARKS
  ACCOUNT                ALLOCATE           ALLOCATE              ALLOCATED      ALLOCATED
  557340                  100.000          155,160                  100.000     155,160
```

```
CFP03 CONTROL TOTALS
INSTITUTION -  COST FINDING PRINCIPLES SAMPLE CROSSOVER
IAI ACTIVITY DATE - 04/01/71
NO. OF INSTITUTION TRANSACTIONS READ ......        71
NO. OF INSTITUTION ACCOUNT NAMES READ .....        71
NO. OF PCS CROSSOVER TRANSACTIONS READ ....        71
NO. OF PCS CROSSOVER RECORDS WRITTEN ......        71
NO. OF LINES PRINTED ......................       572
NO. OF INPUT TRANSACTIONS IGNORED ...........
```

```
     04/01/71                       COST FINDING PRINCIPLES
                          COST FINDING PRINCIPLES SAMPLE CROSSOVER                    PAGE    13

                                INSTITUTION ACCOUNT NUMBER
                                            TO
                                    PCS ACCOUNT NUMBER
                                     CROSSOVER REPORT

    PCS          TOTAL

     11      1,593,544
     14        108,709
     21         62,549
     22         90,415
     41        236,149
     44        238,259
     46        251,119
     50         30,300
     51        414,025
     52         60,100
     53         41,500
     54         23,200
     55        799,910
     61        178,933
     62         52,941
     63         82,991
     64        104,051
     65        257,980
     67         75,435
  TOTAL      4,702,109
```

04/01/71

COST FINDING PRINCIPLES
COST FINDING PRINCIPLES SAMPLE CROSSOVER

PCS ACCOUNT NUMBER
TO
INSTITUTION ACCOUNT NUMBER
CROSSOVER REPORT

PCS ACCOUNT	INSTITUTION ACCOUNT NUMBER	INSTITUTION ACCOUNT NAME	CROSSOVER AMOUNT	
110401	100104	BIOLOGY DEPARTMENT	294,214	
			294,214	TOTAL
110502	100301	ACCOUNTING DEPARTMENT	53,629	
			53,629	TOTAL
110509	100303	MARKETING DEPARTMENT	56,859	
			56,859	TOTAL
110802	100201	ELEMENTARY EDUCATION DEPARTMENT	176,500	
			176,500	TOTAL
110803	100202	SECONDARY EDUCATION DEPARTMENT	192,356	
			192,356	TOTAL
110835	100203	PHYSICAL EDUCATION DEPARTMENT	63,727	
			63,727	TOTAL
111501	100102	ENGLISH DEPARTMENT	196,708	
			196,708	TOTAL
111701	100103	MATHEMATICS DEPARTMENT	91,603	
			91,603	TOTAL
111905	100105	PHYSICAL SCIENCES DEPARTMENT	186,369	
			186,369	TOTAL
112204	100302	ECONOMICS DEPARTMENT	106,678	
			106,678	TOTAL
112205	100101	HISTORY DEPARTMENT	174,901	
			174,901	TOTAL
140000	100900	EXTENSION DIVISION	108,708	
			108,708	TOTAL
21050101	240309	BUREAU OF BUSINESS RESEARCH	51,649	
	250308	BUREAU OF BUSINESS RESEARCH	10,900	
			62,549	TOTAL
22010701	230104	WATERFOWL STUDY	50,000	
			50,000	TOTAL

```
                                    COST FINDING PRINCIPLES
        04/01/71            COST FINDING PRINCIPLES SAMPLE CROSSOVER                       PAGE    2

                                      PCS ACCOUNT NUMBER
                                              TO
                                  INSTITUTION ACCOUNT NUMBER
                                       CROSSOVER REPORT

     PCS                                                                         CROSSOVER
   ACCOUNT      INSTITUTION ACCOUNT NUMBER          INSTITUTION ACCOUNT NAME      AMOUNT

 22042201       220104                       MUTATION PROJECT                       40,415
                                                                                    40,415 TOTAL

 410000         10230001                     CENTRAL LIBRARY-SALARIES               72,000
                10230002                     CENTRAL LIBRARY-WAGES                  61,200
                10230003                     CENTRAL LIBRARY-SUPPLIES AND EXPENSES   5,700
                10230004                     CENTRAL LIBRARY-EQUIPMENT               8,000
                10230021                     CENTRAL LIBRARY-COLLECTIONS            84,100
                10230022                     CENTRAL LIBRARY-SUBSCRIPTIONS           2,100
                                                                                   233,100 TOTAL

 410060         10230023                     CENTRAL LIBRARY-BINDING                 3,049
                                                                                     3,049 TOTAL

 440000         102811                       COMPUTING CENTER                      238,259
                                                                                   238,259 TOTAL

 460000         100100                       COLLEGE OF ARTS AND SCIENCES          120,000
                                                                                   120,000 TOTAL

 460040         100800                       GRADUATE SCHOOL                        40,919
                                                                                    40,919 TOTAL

 460500         100300                       SCHOOL OF BUSINESS                     46,200
                                                                                    46,200 TOTAL

 460800         100200                       SCHOOL OF EDUCATION                    44,000
                                                                                    44,000 TOTAL

 500000         102402                       DEAN OF STUDENTS .                     30,300
                                                                                    30,300 TOTAL

 517110         102100                       STUDENT NEWSPAPER                      30,600
                                                                                    30,600 TOTAL

 517120         260100                       STERLING LECTURES                      15,415
                                                                                    15,415 TOTAL

 517140         103004                       STUDENT UNION                          28,300
                353004                       STUDENT UNION                          23,820
                                                                                    52,120 TOTAL

 517200         103001                       INTERCOLLEGIATE ATHLETICS              69,200
```

```
                                          COST FINDING PRINCIPLES
      04/01/71                  COST FINDING PRINCIPLES SAMPLE CROSSOVER                     PAGE    3

                                            PCS ACCOUNT NUMBER
                                                    TO
                                        INSTITUTION ACCOUNT NUMBER
                                             CROSSOVER REPORT

      PCS                                                                                    CROSSOVER
    ACCOUNT       INSTITUTION ACCOUNT NUMBER                INSTITUTION ACCOUNT NAME           AMOUNT

                  323001                    INTERCOLLEGIATE ATHLETICS                          245,690
                                                                                               315,890 TOTAL

  520000          102200                    REMEDIAL SKILLS CENTER                              32,550
                  270100                    EUROPEAN EXPOSURE PROGRAM                           27,550
                                                                                                60,100 TOTAL

  530000          102404                    COUNSELING CENTER                                   41,500
                                                                                                41,500 TOTAL

  540000          102405                    FINANCIAL AIDS OFFICE                               23,200
                                                                                                23,200 TOTAL

  557310          103003                    FOOD SERVICES                                       17,700
                  343003                    FOOD SERVICES                                      289,600
                                                                                               307,300 TOTAL

  557320          102403                    STUDENT HEALTH SERVICE                              78,600
                                                                                                79,200 TOTAL

  557330          103002                    RESICENCE HALLS                                     19,900
                  333002                    RESICENCE HALLS                                    231,900
                                                                                               251,800 TOTAL

  557340          103005                    STUDENT STORE                                        6,850
                  353005                    STUDENT STORE                                      155,160
                                                                                               162,010 TOTAL

  618110          102601                    GOVERNING BOARD                                      3,600
                  102602                    PRESIDENTS OFFICE                                   46,200
                  102603                    ACADEMIC VICE-PRESIDENT                             40,400
                  102604                    VICE PRESIDENT FOR BUSINESS AFFAIRS                 46,500
                                                                                               136,700 TOTAL

  618120          102810                    INSTITUTIONAL RESEARCH                              35,483
                                                                                                35,483 TOTAL

  618130          102605                    LEGAL COUNSEL                                        6,750
                                                                                                 6,750 TOTAL

  628210          102902                    ACCOUNTING OFFICE                                   52,941
                                                                                                52,941 TOTAL
```

```
04/01/71                          COST FINDING PRINCIPLES
                          COST FINDING PRINCIPLES SAMPLE CROSSOVER                PAGE    4

                                 PCS ACCOUNT NUMBER
                                         TO
                                INSTITUTION ACCOUNT NUMBER
                                    CROSSOVER REPORT

    PCS
  ACCOUNT      INSTITUTION ACCOUNT NUMBER          INSTITUTION ACCOUNT NAME               CROSSOVER
                                                                                           AMOUNT
 638160           102806               LIABILITY INSURANCE
                                                                                           14,668
                                                                                           14,668 TOTAL
 638220           102401               REGISTRAR
                  102803               BULLETINS AND CATALOGUES                            32,500
                                                                                           35,803
                                                                                           68,303 TOTAL
 648170           102507               POLICE AND WATCHMEN
                                                                                           31,446
                                                                                           31,446 TOTAL
 648251           10280552             MAIL AND DISTRIBUTION
                                                                                            3,460
                                                                                            3,460 TOTAL
 648252           10280553             TELEPHONE
                                                                                            8,245
                                                                                            8,245 TOTAL
 648253           10280551             PRINTING AND REPRODUCTION
                                                                                           18,600
                                                                                           18,600 TOTAL
 648260           102506               VEHICLES AND MAJOR EQUIPMENT
                                                                                           42,300
                                                                                           42,300 TOTAL
 658310           102504               UTILITIES
                                                                                           61,700
                                                                                           61,700 TOTAL
 658320           102501               PHYSICAL PLANT DIRECTOR
                  102503               BUILDING MAINTENANCE                                23,600
                  102508               PROPERTY INSURANCE                                  62,900
                                                                                           17,280
                                                                                          103,780 TOTAL
 658340           102502               CUSTODIAL SERVICES
                                                                                           92,500
                                                                                           92,500 TOTAL
 678100           102801               ALUMNI OFFICE
                  102804               COMMENCEMENT                                        30,900
                  102807               MEMBERSHIPS                                          3,300
                  102808               PUBLICATIONS PURCHASE AND SUBSCRIPTIONS             16,218
                  102[illegible]       PUBLIC RELATIONS OFFICE                                860
                                                                                           24,157
                                                                                           75,435 TOTAL
```

```
CFP05 CONTROL TOTALS
INSTITUTION -  COST FINDING PRINCIPLES SAMPLE CROSSOVER
IAI ACTIVITY DATE - 04/01/71
NO. PCS CROSSOVER RECORDS READ ........       71
NO. PCS ACCOUNT BALANCES WRITTEN .....       50
NO. LINES PRINTED ......................      157
```

APPENDIX D

FACULTY ACTIVITY ANALYSIS PROCEDURES MANUAL

APPENDIX D

THE NATIONAL CENTER FOR HIGHER EDUCATION MANAGEMENT SYSTEMS
(NCHEMS)
AT WICHE

FACULTY ACTIVITY ANALYSIS PROCEDURES MANUAL
(CONDENSED)

Prepared by:
Leonard Romney

Note: This is a preliminary edition and is subject to change by the Faculty Activity Analysis Task Force and Technical Council.

The paragraphs on the following pages have been condensed from two papers currently being prepared by the FAA task force and staff: Faculty Activity Analysis: Overview and Major Issues and Faculty Activity Analysis Procedures Manual.

The first FAA paper, Faculty Activity Analysis: Overview and Major Issues, discusses the issues which must be addressed when a faculty resource survey is being considered.

A. Assignments, Activities, Effort

Three aspects of faculty workload are discussed in the FAA paper: assignments, activities, and effort.

Assignments are the components of faculty workload which are expected to be performed in return for salary. Assignments are expected tasks such as participation on specific research contracts, advising a number of students, and filling one or more committee assignments. Assignments pertain to "before the fact" considerations.

Activities are tasks actually performed, some in order to fulfill a particular assignment and others which pertain to tasks other than those assigned. Some sets of the activities may correspond directly to particular assignments. For example, the assignment to teach an introductory physics course (or section) involves a set of teaching activities such as course preparation, teaching, evaluation, and student advising. Other activities which do not relate to a particular assignment may be such things as professional development and even individual research.

As defined in the FAA paper, effort, as a measure of the faculty resource, differs in kind rather than degree from faculty assignments and activities. To measure faculty effort is to measure not only time spent performing certain activities, but it also implies an ability to measure intensity of involvement, the degree to which one's abilities are involved and challenged, and the relationships between these factors and the instructional process. Essentially, faculty effort analysis is input analysis, a technique which is far from mastered in the higher education community at the present time.

Faculty assignments and faculty activities both to various degrees have been the subject of faculty resource surveys. Although there are numerous examples of studies of both aspects of faculty appointments, there seems to be no example of a case in which both have been used. Analyzing costs for a specific period of time should be dependent upon an analysis of faculty activities since program costs should be identified with actual resource utilization rather than anticipated resource utilization.

Assignment analysis, however, may be easier to handle and therefore may be a more expedient alternative to an activity analysis. It is an acceptable alternative if assignments reflect accurately actual resource utilization. Typically, however, assignments do not cover the full range of activities in which faculty engage. This may vary from institution to institution. If at a particular institution it were found that activities correspond directly to assignments, assignment analysis would be an acceptable substitute. However, both an assignment and activity analysis should be conducted periodically to assure direct correspondence between the two. Phase II of CFP will test both methods.

B. Kinds of Assignments and Activities to be Included

There are certain activities which do not change as a function of a faculty member's formal assignment. That is, these activities are done regardless of one's assignments. For example, some research activities (which are more likely self imposed tasks rather than departmentally assigned projects) are conducted by virture of personal interest alone and are not likely to cease because of modifications in one's assignments. Similarly, the time which a faculty member devotes to general reading in order to keep abreast of his discipline is not likely to change as his assignments are changed (unless, of course, the assignments are so overwhelming as to preclude such activities).

Although the results of all faculty activities are perhaps of importance to, and have implications for, the goals and objectives of the institution, most institutions are unwilling to pay for all activities. It is probably a valid institutional expectation that some faculty activities such as professional development will be done by virture of normal professional obligations and will therefore fall outside of the typical appointment contract. As far as cost finding is concerned, institutions should include only those things for which they are paying. However, "non-costable" activities may be recognized through pay increases and promotions.

Among the numerous problems that arise from this limitation is the fact that the number and types of these costable activities vary from institution to institution. Some institutions explicitly "buy" and contract for all of a faculty member's time and energies. Other institutions purchase professional development and allow released time for consulting in additional to regular teaching and research assignments. Therefore, the relative limits of the scope of activities to be included in the survey can be defined, but the exact dimensions and categories within this scope cannot. Categories of "costable" activities must be institutionally defined.

C. Relationship of Activities and Assignments to Institutional Objectives

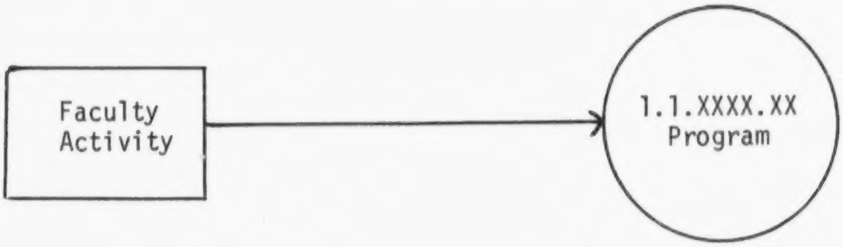
Data on faculty need be acquired not only concerning his activitie but also how these activities affect and relate to institutional objectives. At issue is the measure of this relationship. Ideally, faculty activities could be related directly to the outputs they produced. Thus, the link between faculty activities and institutional objectives would exist, given that the objectives of the institution were stated in terms of specific outputs expected.

However, the state of the art is not sufficiently advanced to allow the use of outputs in this fashion. First, the outputs of higher education have not been specified. Secondly, they have not been quantified. The Center staff is currently engaged in a project designed to accomplish this. In the meantime, however, an alternative measure must be sought.

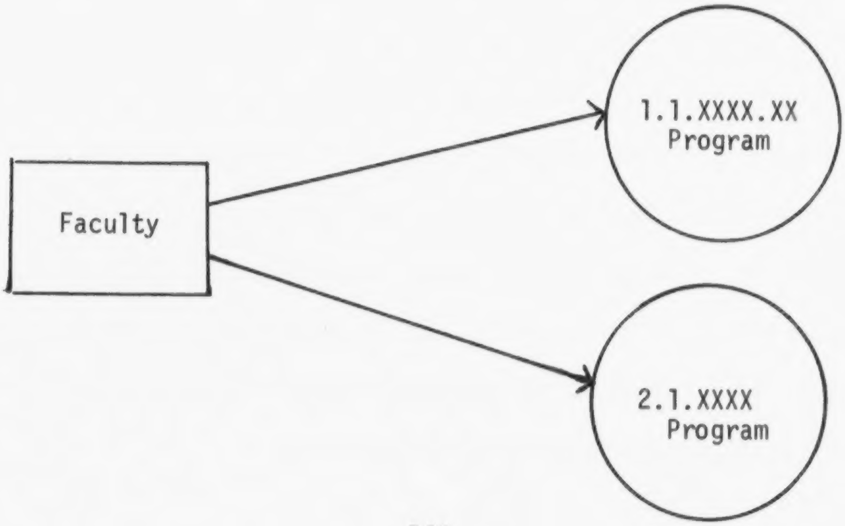
Until outputs are defined and quantified, the programs of the PCS can serve as the link between faculty activities and assignments. The approach then is to survey faculty concerning not only their activities but also how these activities contribute to institutional programs as defined by the Program Classification Structure. The proposed approach is essentially two-dimensional. As presently conceived by the FAA task force, the program dimension of the survey instrument will be written in terms of major programs of the PCS. The level of detail required by the CFP project can be obtained by combining program information with the infomation carried in the activities dimension.

One of the most frequent faculty arguments against any sort of faculty resource survey is that there is no opportunity for registering "joint effects." The Program Classification Structure does not make any allowances for categories such as "joint effects." This does not preclude, however, the possibility of creating additional sub-divisions of the program dimension in which the joint effect issue can be registered.

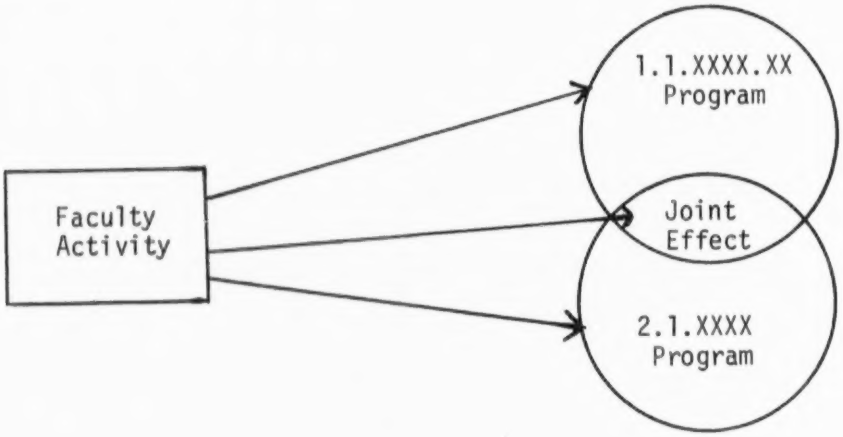
Specific faculty activities may contribute to single programs as shown below:


Faculty Activity
1.1.XXXX.XX Program

Specific faculty activities may contribute to multiple programs:


1.1.XXXX.XX Program
Faculty
2.1.XXXX Program

Or specific faculty activities may contribute jointly to multiple programs:



The intent is that the suggested approach permit faculty to record any or all of the effects demonstrated in the preceding diagrams. This technique should in no way be construed to imply that there are joint programs. By definition, there simply are not. There are activities which affect multiple programs jointly. The FAA survey instrument will permit such effects to be recorded. Proration of these "joint effects" back to individual programs will be an administrative concern.

The program dimension of the NCHEMS conceptual approach to faculty activity analysis looks like the following:

Figure 1

The Program Dimension of the
Proposed Conceptual Approach

1.0	2.0	3.0	4.0	5.0	6.0	7.0	
Instruction Program	Organized Research Program	Public Service Program	Academic Support Program	Student Support Program	Institutional Support Program	Independent Operations Program	Joint Effects

D. Specification of Assignment and Activity Categories

For the purpose of cost finding, the assignment and activity categories are to be restricted to those for which the institution is willing to pay. The problem is that the number and types of activities which are costable vary from institution to institution. Some institutions formally assign or allot a portion of time to professional development and consulting; others do not. Therefore, the FAA task force approach is to provide a comprehensive list of activity categories which is exhaustive of all faculty functions which pertain to institutional objectives. These categories are designed to be mutually exclusive as well as exhaustive. From this list, then, the institution can select a subset of activity categories for which it is willing to pay.

In accordance with these guidelines, the following list of activity categories has been devised.

- A. Teaching Activities
  - A.1 Formally Scheduled Teaching Activities
  - A.2 Contact Related Activities
  - A.3 Planning, Innovating, and Programming Activities
  - A.4 Informal, Unscheduled Teaching Activities
- B. General Faculty Service Activities
  - B.1 Student Oriented Service Activities
  - B.2 Colleague Oriented Service Activities
  - B.3 Institution Oriented (Professional) Service
  - B.4 Institution Oriented Service (Miscellaneous) Activities
- C. Administrative Activities
  - C.1 Department Administrative Activities
  - C.2 College Administrative Activities
  - C.3 Institution Administrative Activities
- D. Committee Activities
  - D.1 Department Committee Activities
  - D.2 College Committee Activities
  - D.3 Institution Committee Activities
- E. Research, Scholarship, and Creative Works Activities
  - E.1 Separately Budgeted Research and Creative Work Project Activites
  - E.2 Not Separately Budgeted Research and Creative Work Project Activities
  - E.3 General Research, Scholarship and Creative Work Activities

F. Extra Institutional Service Activities

F.1 Public Service Activities

F.2 Private Consulting Activities

In summary, the proposed listing of activity categories has been designed to permit the individual institution to make the easiest, most valid, and most accurate assessment of the relationships between the faculty resource and institutional programs. The listing permits the institution to separate those activities which are deemed to be costable from those which maintain and/or improve the faculty member's competence to perform his tasks but which are thought not to be costable. Which, if any of these, fall into the latter non-costable group is an institutional decision.

Figure 2 shows the results of combining the two dimensions of the conceptual approach to form the entire Activity/Program Maxtrix. This matrix is the conceptual foundation to the approach being discussed.

A particular cell in the matrix is to be interpreted as the time spent in a given activity mode which contributes to a specific institutional program. The summation of all cells in a particular row represents the total time spend in that specific activity or assignment. The summation of all cells in a particular column indicates the total time devoted to that specific program.

Figure 2

The Conceptual Approach

The Activity/Program Matrix

The Program Dimension

The Activity Dimension			1.0 Instruction Program	2.0 Organized Research Program	3.0 Public Service Program	4.0 Academic Support Program	5.0 Student Support Program	6.0 Institutional Support Program	7.0 Independent Operations Program	Joint Effects
A.1	Formally Scheduled Teaching Activities	Teaching Activities								
A.2	Contact Related Activities									
A.3	Planning, Innovating, and Programming Activities									
A.4	Informal, Unscheduled Teaching Activities									
B.1	Student Oriented Service Activities	General Faculty Service Activities								
B.2	Colleague Oriented Service Activities									
B.3	Institution Oriented (Professional) Service Activities									
B.4	Institution Oriented (Miscellaneous) Service Activities									
C.1	Department Administrative Activities	Administrative Activities								
C.2	College Administrative Activities									
C.3	Institution Administrative Activities									
D.1	Department Committee Activities	Committee Activities								
D.2	College Committee Activities									
D.3	Institution Committee Activities									
E.1	Separately Budgeted Research & Creative Work Project Activities	Research, Scholarship,& Creative Works Activities								
E.2	Not Separately Budgeted Research & Creative Work Project Activities									
E.3	General Research, Scholarship, & Creative Work Activities									
F.1	Public Service Activities	Extra Institutional Servie Act								
F.2	Private Consulting Activities									

E. Data Collection Procedures

Currently, the FAA task force is suggesting the following procedures for gathering the data. It must be recognized however, that much work remains to be done in this area.

1. Survey Population

The instrument has been designed to be sent to the following persons: Anyone with a teaching title, equivalent academic title, or anyone regardless of title who is engaged in formal classroom instruction. Thus, anyone who teaches a formally organized class or course or section at the institution is to receive and complete the survey instrument. Moreover, all such persons are to distribute all of their activities to institutional programs. For example, the librarian who teaches one course in library science would register not only the effects of teaching that course but also the activities associated with all of his (her) other responsibilities as well as those which pertain to his (her) professional career. Institutional executives who teach courses would not be exempt. Graduate students and adjunct personnel who teach also are to be included.

2. Data Gathering

The question of sampling versus a total population survey is difficult to answer since the answer is dependent upon the use of the information. Long range planning, institutional resource allocation, institutional resource utilization, and program review and evaluation functions all could be adequately supported by data gathered through sampling techniques. On the other hand, effective departmental management may well require information from each member of the faculty individually. Therefore, the answer to the question still remains an institutional perogative based upon the use(s) to be made of the information.

When sampling teachniques are used, the design of the random sample should be stratified to reflect at least the following variables:

1. Faculty Rank
2. Discipline

To design the required size of the stratified random sample will require advice from experts in the field of sample design. At least the following must be determined:

1. Total number of respondents by rank and discipline
2. Sampling fraction for each of the categories of faculty by rank and discipline

3. Expected number of respondents for each category of faculty by rank and discipline
4. Procedures for selecting those who are to respond to the questionnaire.

In the case of total population survey, special attention must be given to avoiding the pitfalls inherent in this technique. For example, seldom is the response rate to a total enumeration survey above 85%. The unresponsive faculty who constitute the remaining 15% frequently are similar enough so as to bias the results of the survey. Care must be taken not to let them exclude themselves.

3. Time Period

The survey instrument has been designed to gather data on faculty activities for a specific week during an academic term. However, in the paper, Faculty Activity Analysis: Overview and Major Issues, a great deal of discussion is devoted to the variability of faculty activities during the course of an academic term. Typically, faculty devote different amounts of time to different activities during different periods of an academic term.

A possible solution to this problem may be to survey different fractions of the sample or of the total faculty during a number of different weeks of the term. For example, 1/5 of the sample or faculty could be surveyed during the second week, a second 1/5 during the fourth week and so on. Thereby, normalized data based on this technique would reflect or take into account variations in faculty activities over a given period of time.

F. Example Use of the Conceptual Approach

A sample survey instrument will be developed by the FAA Task Force as a model. A preliminary design of this instrument is shown as Figure 3, page 159. Figure 3 also illustrates a method by which a faculty member could record his activities on the survey form. The format is designed to allow an indication of the various programs to which his activities contribute. Subsequently, the appropriate PCS codes would be compiled from the information presented in both dimensions of the approach. Table 2 (page 160) shows the results of this coding procedure.

G. Summary

The preceding pages contain a suggested approach to faculty activity analysis. The approach is not just a method for inventorying faculty time devoted to activities. It also includes techniques for acquiring information concerning the contribution of these activities to institutional programs. A sample form has been included as well as suggestions as to appropriate techniques for gathering the data. A subsequent document will be devoted to a discussion of procedures for analyzing the data.

FIGURE 3

FACULTY ACTIVITY AND OUTPUT SURVEY FORM

Name: Gordon Wingate
Department: German
Number: 525-48-8819
Rank: Professor

	(1) Activity	Course Number	Department	Section	Contact Hours Lec	Disc	Lab	(2) Percentage of Time Devoted to Activities	Distribution of Percentage to Programs (3) 1.0 Instruction Program	(4) 2.0 Organized Research Program	(5) 3.0 Public Service Program	(6) 4.0 Academic Support Program	(7) 5.0 Student Service Program	(8) 6.0 Institutional Support Program	(9) 7.0 Independent Operations Program	(10) Joint Effects Programs	(11) Percentage
A. Teaching Activities	A.1 Formally Scheduled Teaching Activities																
		182	210	04	4			14%	14%								
		343	210	01	3			12%	12%								
		699	210	01	2			15%	10%	5%							
	A.2 Contact Related Activities																
		182	210	04	4			10%	10%								
		343	210	01	3			8%	8%								
	A.3 Planning, Innovating, and Programming Activities																
	A.4 Informal Unscheduled Teaching Activities																
B. General Faculty Service Activities	B.1 Student Oriented Service Activities German Club							10%					10%				
	B.2 Colleague Oriented Service Activities																
	B.3 Institution Oriented Service (Professional) Activities																
	B.4 Institution Oriented Service (Miscellaneous) Activities																
C. Administrative Activities	C.1 Department Administrative Activities Asst. Chairman							8%				8%					
	C.2 College Administrative Activities																
	C.3 Institution Administrative Activities																
D. Committee Activities	D.1 Department Committee Activities																
	D.2 College Committee Activities																
	D.3 Institution Committee Activities Campus Planning							4%						4%			
E. Research, Scholarship, and Creative Works Activities	E.1 Separately Budgeted Research & Creative Work Project Activities																
	Project No. 168492							19%		19%							
	Project No.																
	Project No.																
	E.2 Not Separately Budgeted Research & Creative Work Project Activities																
	E.3 General Research, Scholarship & Creative Work Activities																
F. Extra Institutional Service Activities																	
	F.1 Public Service Activities																
	F.2 Private Consulting Activities																
	TOTAL							100%	54%	24%		8%	10%	4%			

Estimated Total Hours Spent in Above Activities for the Week of (________) 57

Table 2

Distribution of Faculty Member's Salary to Cost Centers

Cost Center Name	Cost Center Code	Salary	Percentage of time	Distributed Salary
General Academic Instruction - Lower Division German	1.1.1103.20	$16,000	14%	$ 2,240
General Academic Instruction - Upper Division German	1.1.1103.30	16,000	12%	1,920
General Academic Instruction - Graduate German	1.1.1103.50	16,000	10%	1,600
Individual or Project Research - German	2.2.1103	16,000	5%	800
General Academic Instruction - Lower Division German	1.1.1103.20	16,000	10%	1,600
General Academic Instruction - Upper Division German	1.1.1103.30	16,000	8%	1,280
Social and Cultural Development - Student Organizations	5.1.7130	16,000	10%	1,600
Academic Administration - German	4.6.1103	16,000	8%	1,280
Executive Management - Planning and Programming	6.1.8120	16,000	4%	640
Individual or Project Researcher - German	2.2.1103	16,000	19%	3,040
	Totals		100%	$16,000

APPENDIX E

SAMPLE ALLOCATIONS

APPENDIX E

COST FINDING PRINCIPLES

Sample Allocations

Parameter Code	Parameter Name
Parm 1	Crossover Balance
Parm 2	Credit Hour
Parm 3	Contact Hour
Parm 4	FTE Employees
Parm 5	FTE Faculty
Parm 6	Total Budget
Parm 7	Number of Sections
Parm 8	Assignable Square Feet

```
WCFP08                                                                                                   PAGE   1
                                             PCS ACCOUNT BALANCES

            ACCOUNT NUMBER              PARM  1    PARM  2    PARM  3    PARM  4    PARM  5    PARM  6    PARM  7    PARM  8

110401                                  294214.         0.         0.         0.         0.         0.         0.         0.
11040110                                    0.       801.       961.         4.         3.     52959.        13.      2742.
11040210                                    0.       263.       322.         2.         1.     26479.         3.      1030.
11040220                                    0.       268.       332.         2.         1.     38242.         4.      1171.
11040230                                    0.        94.       131.         1.         0.     32364.         1.       505.
11040710                                    0.       392.       471.         3.         2.     38245.         5.      1677.
11040720                                    0.       312.       374.         2.         2.     41190.         5.      1369.
11040730                                    0.        99.       139.         1.         0.     29421.         1.       556.
110502                                   53629.         0.         0.         0.         0.         0.         0.         0.
11050210                                    0.       182.       162.         1.         0.      9653.         2.       344.
11050220                                    0.       283.       223.         1.         1.     22524.         4.       551.
11050230                                    0.       170.       173.         1.         0.     21452.         3.       328.
110509                                   55859.         0.         0.         0.         0.         0.         0.         0.
11050910                                    0.       123.       120.         0.         0.      6623.         1.       244.
11050920                                    0.       282.       242.         1.         1.     24449.         4.       577.
11050930                                    0.       190.       190.         1.         1.     25537.         4.       422.
110802                                  176590.         0.         0.         0.         0.         0.         0.         0.
11080210                                    0.       353.       369.         2.         1.     17550.         5.       665.
11080220                                    0.      1162.      1162.         6.         4.     70600.        17.      2103.
11080230                                    0.       865.       865.         4.         3.     89250.        15.      1571.
110803                                  192355.         0.         0.         0.         0.         0.         0.         0.
11080310                                    0.       459.       459.         2.         2.     23083.         7.       894.
11080320                                    0.       834.       834.         5.         4.     57707.        11.      1616.
11080330                                    0.      1008.      1008.         6.         4.    111566.        16.      1964.
110835                                   63727.         0.         0.         0.         0.         0.         0.         0.
11083510                                    0.       795.      1590.         4.         4.     47795.        23.      1049.
11083520                                    0.       130.       260.         0.         0.     15932.         6.       718.
111501                                  196708.         0.         0.         0.         0.         0.         0.         0.
11150110                                    0.      1283.      1253.         5.         5.     55076.        15.      2259.
11150120                                    0.      1225.      1225.         6.         5.     76683.        15.      2179.
11150130                                    0.       457.       457.         2.         1.     62947.         9.       853.
111701                                   91603.         0.         0.         0.         0.         0.         0.         0.
11170110                                    0.      1176.      1176.         5.         4.     71450.        14.      1989.
11170120                                    0.       273.       273.         1.         1.     20153.         3.       463.
11190210                                    0.       192.       234.         1.         1.     22364.         3.       705.
11190220                                    0.       292.       250.         3.         2.     57774.         6.      1303.
111905                                  165369.         0.         0.         0.         0.         0.         0.         0.
11190510                                    0.       357.       407.         3.         2.     35410.         6.      1454.
11190520                                    0.       436.       530.         4.         3.     70620.         8.      3831.
112204                                  105576.         0.         0.         0.         0.         0.         0.         0.
```

```
WCFP08                                                                                                            PAGE   2
                                                     PCS ACCOUNT BALANCES

          ACCOUNT NUMBER              PARM  1     PARM  2     PARM  3     PARM  4     PARM  5     PARM  6     PARM  7     PARM  8

 11220410                                  0.        894.        894.          4.          3.      43738.         11.       1612.
 11220420                                  0.        435.        435.          2.          1.      33070.          6.        775.
 11220430                                  0.        249.        249.          1.          1.      24870.          4.        451.
 112205                               174901.          0.          0.          0.          0.          0.          0.          0.
 11220510                                  0.       1103.       1108.          5.          4.      47223.         13.       1945.
 11220520                                  0.       1121.       1121.          5.          4.      71709.         14.       1974.
 11220530                                  0.        464.        464.          2.          1.      55965.          8.        609.
 140000                                108708.       1341.       1382.          8.          7.      95663.         10.        210.
 21050101                               62549.          0.          0.          6.          5.      62549.          0.       1200.
 22010701                               50000.          0.          0.          2.          1.      50000.          0.        422.
 22042201                               40415.          0.          0.          1.          1.      40415.          0.        405.
 310000                                     0.          0.        523.          1.          1.      13045.         21.        210.
 320000                                     0.          0.          0.          0.          0.       9270.          0.          0.
 410000                                233100.          0.          0.          0.          0.          0.          0.          0.
 410050                                  3049.          0.          0.          0.          0.          0.          0.          0.
 440000                                238259.          0.          0.          0.          0.          0.          0.          0.
 460000                                120000.          0.          0.          0.          0.          0.          0.          0.
 460040                                 40919.          0.          0.          0.          0.          0.          0.          0.
 460500                                 46200.          0.          0.          0.          0.          0.          0.          0.
 460900                                 44000.          0.          0.          0.          0.          0.          0.          0.
 500000                                 30300.          0.          0.          0.          0.          0.          0.          0.
 517110                                 30800.          0.          0.          0.          0.          0.          0.          0.
 517120                                 15415.          0.          0.          0.          0.          0.          0.          0.
 517140                                 52120.          0.          0.          0.          0.          0.          0.          0.
 517200                                315690.          0.          0.          0.          0.          0.          0.          0.
 520000                                 60100.          0.          0.          0.          0.          0.          0.          0.
 530000                                 41500.          0.          0.          0.          0.          0.          0.          0.
 540000                                 23200.          0.          0.          0.          0.          0.          0.          0.
 557310                                307300.          0.          0.          0.          0.          0.          0.          0.
 557320                                 78800.          0.          0.          0.          0.          0.          0.          0.
 557330                                251800.          0.          0.          0.          0.          0.          0.          0.
 557340                                162010.          0.          0.          0.          0.          0.          0.          0.
 618110                                135700.          0.          0.          0.          0.          0.          0.          0.
 618120                                 35483.          0.          0.          0.          0.          0.          0.          0.
 618130                                  6750.          0.          0.          0.          0.          0.          0.          0.
 628210                                 52941.          0.          0.          0.          0.          0.          0.          0.
 638160                                 14588.          0.          0.          0.          0.          0.          0.          0.
 638220                                 68303.          0.          0.          0.          0.          0.          0.          0.
 648170                                 31446.          0.          0.          0.          0.          0.          0.          0.
 648251                                  3460.          0.          0.          0.          0.          0.          0.          0.
```

```
WCFP09                                                                                                             PAGE   3

                                            PCS ACCOUNT BALANCES

          ACCOUNT NUMBER              PARM  1    PARM  2    PARM  3    PARM  4    PARM  5    PARM  6    PARM  7    PARM  8

648252                                  9245.         0.         0.         0.         0.         0.         0.         0.
648253                                 13500.         0.         0.         0.         0.         0.         0.         0.
648260                                 42300.         0.         0.         0.         0.         0.         0.         0.
658310                                 61700.         0.         0.         0.         0.         0.         0.         0.
658320                                103730.         0.         0.         0.         0.         0.         0.         0.
658340                                 92500.         0.         0.         0.         0.         0.         0.         0.
678100                                 75435.         0.         0.         0.         0.         0.         0.         0.
                                   ---------- ---------- ---------- ---------- ---------- ---------- ---------- ----------
        PARAMETER TOTALS              4702109.     20421.     22670.      117.        87.   1829179.      323.     47316.
```

```
MCFP08                                                                                               PAGE   4

ALLOCATION:  ----------------DONOR ACCOUNTS----------------           --------------RECIPIENT ACCOUNTS--------------
             ACCOUNT                               OLD BALANCE        ACCOUNT                           OLD BALANCE
             #578100                               $    75435.        #11040110                         $        0.
                                                                      #11040210                         $        0.
                                                                      #11040220                         $        0.
                                                                      #11040230                         $        0.
                                                                      #11040710                         $        0.
                                                                      #11040720                         $        0.
                                                                      #11040730                         $        0.
                                                                      #110502                           $    53629.
                                                                      #11050210                         $        0.
                                                                      #11050220                         $        0.
                                                                      #11050230                         $        0.
                                                                      #110509                           $    56359.
                                                                      #11050910                         $        0.
                                                                      #11050920                         $        0.
                                                                      #11050930                         $        0.
                                                                      #110802                           $   176500.
                                                                      #11080210                         $        0.
                                                                      #11080220                         $        0.
                                                                      #11080230                         $        0.
                                                                      #110803                           $   192356.
                                                                      #11080310                         $        0.
                                                                      #11080320                         $        0.
                                                                      #11080330                         $        0.
                                                                      #110835                           $    63727.
                                                                      #11083510                         $        0.
                                                                      #11083520                         $        0.
                                                                      #111501                           $   196708.
                                                                      #11150110                         $        0.
                                                                      #11150120                         $        0.
                                                                      #11150130                         $        0.
                                                                      #111701                           $    91603.
                                                                      #11170110                         $        0.
                                                                      #11170120                         $        0.
                                                                      #11190210                         $        0.
```

```
WCFP09                                                                                      PAGE   5
                                                                #11190220                    $        0.
                                                                #111905                      $   186369.
                                                                #11190510                    $        0.
                                                                #11190520                    $        0.
                                                                #112204                      $   106678.
                                                                #11220410                    $        0.
                                                                #11220420                    $        0.
                                                                #11220430                    $        0.
                                                                #112205                      $   174901.
                                                                #11220510                    $        0.
                                                                #11220520                    $        0.
                                                                #11220530                    $        0.
                                                                #140000                      $   108708.
                                                                #21050101                    $    62549.
                                                                #22010701                    $    50000.
                                                                #22042201                    $    40415.
                                                                #310000                      $        0.
                                                                #320000                      $        0.
        ACCOUNT                   NEW BALANCE                   ACCOUNT                      NEW BALANCE
        #678100                   $          0.                 #11040110                    $     2164.
                                                                #11040210                    $     1092.
                                                                #11040220                    $     1577.
                                                                #11040230                    $     1345.
                                                                #11040710                    $     1577.
                                                                #11040720                    $     1549.
                                                                #11040730                    $     1213.
                                                                #110502                      $    53629.
                                                                #11050210                    $      393.
                                                                #11050220                    $      929.
                                                                #11050230                    $      839.
                                                                #110509                      $    55559.
                                                                #11050910                    $      261.
                                                                #11050920                    $     1008.
                                                                #11050930                    $     1055.
                                                                #110802                      $   176500.
                                                                #11080210                    $      728.
                                                                #11080220                    $     2912.
                                                                #11080230                    $     3639.
                                                                #110803                      $   192356.
```

```
                                                              #11080310                         $      952.
                                                              #11080320                         $     2330.
                                                              #11080330                         $     4601.
                                                              #110835                           $    63727.
                                                              #11083510                         $     1971.
                                                              #11083520                         $      657.
                                                              #111501                           $   196708.
                                                              #11150110                         $     2271.
                                                              #11150120                         $     3245.
                                                              #11150130                         $     2596.
                                                              #111701                           $    91603.
                                                              #11170110                         $     2947.
                                                              #11170120                         $      331.
                                                              #11190210                         $      922.
                                                              #11190220                         $     2383.
                                                              #111905                           $   186369.
                                                              #11190510                         $     1460.
                                                              #11190520                         $     2921.
                                                              #112204                           $   108676.
                                                              #11220410                         $     1804.
                                                              #11220420                         $     1364.
                                                              #11220430                         $     1232.
                                                              #112205                           $   174901.
                                                              #11220510                         $     1947.
                                                              #11220520                         $     2357.
                                                              #11220530                         $     2306.
                                                              #140000                           $   112553.
                                                              #21050101                         $    55129.
                                                              #22010701                         $    52062.
                                                              #22042201                         $    42062.
                                                              #310000                           $      538.
                                                              #320000                           $      362.

ALLOCATION: ----------------DONOR ACCOUNTS---------------     ---------------RECIPIENT ACCOUNTS-------------
            ACCOUNT                          OLD BALANCE      ACCOUNT                         OLD BALANCE
            #658310                          $    61700.      #11040110                       $     2184.
            #658320                          $   103780.      #11040210                       $     1092.
            #658340                          $    92500.      #11040220                       $     1577.
```

```
WCFP08
                                                          PAGE   7
                #11040230                        $      1335.
                #11040710                        $      1577.
                #11040720                        $      1699.
                #11040730                        $      1213.
                #110502                          $     53629.
                #11050210                        $       398.
                #11050220                        $       929.
                #11050230                        $       335.
                #110509                          $     55359.
                #11050910                        $       261.
                #11050920                        $      1008.
                #11050930                        $      1055.
                #110802                          $    176500.
                #11080210                        $       728.
                #11080220                        $      2912.
                #11080230                        $      3629.
                #110803                          $    192356.
                #11080310                        $       952.
                #11080320                        $      2366.
                #11080330                        $      4601.
                #110835                          $     63727.
                #11083510                        $      1971.
                #11083520                        $       657.
                #111501                          $    196703.
                #11150110                        $      2271.
                #11150120                        $      3245.
                #11150130                        $      2596.
                #111701                          $     91603.
                #11170110                        $      2947.
                #11170120                        $       831.
                #11190210                        $       922.
                #11190220                        $      2363.
                #111905                          $    186359.
                #11190510                        $      1460.
                #11190520                        $      2421.
                #112204                          $    106678.
                #11220410                        $      1804.
                #11220420                        $      1364.
                #11220430                        $      1232.
                #112205                          $    174901.
```

```
WCFP08                                                                                        PAGE   6
                                                               #11220510                 $      1947.
                                                               #11220520                 $      2957.
                                                               #11220530                 $      2306.
                                                               #140000                   $    112653.
                                                               #21050101                 $     65129.
                                                               #22010701                 $     52062.
                                                               #22042201                 $     42092.
                                                               #310000                   $       538.
                                                               #320000                   $       362.
        ACCOUNT                    NEW BALANCE                 ACCOUNT                   NEW BALANCE
        #658210                    $          0.               #11040110                 $     17134.
        #658320                    $          0.               #11040210                 $      6980.
        #658340                    $          0.               #11040220                 $      7962.
                                                               #11040230                 $      4088.
                                                               #11040710                 $     10721.
                                                               #11040720                 $      9272.
                                                               #11040730                 $      4245.
                                                               #110502                   $     53629.
                                                               #11050210                 $      2225.
                                                               #11050220                 $      3933.
                                                               #11050230                 $      2673.
                                                               #110509                   $     56659.
                                                               #11050910                 $      1612.
                                                               #11050920                 $      4154.
                                                               #11050930                 $      3356.
                                                               #110802                   $    176500.
                                                               #11080210                 $      4453.
                                                               #11080220                 $     14376.
                                                               #11080230                 $     12205.
                                                               #110803                   $    192356.
                                                               #11080310                 $      5626.
                                                               #11080320                 $     11291.
                                                               #11080330                 $     15309.
                                                               #110835                   $     63727.
                                                               #11083510                 $      7909.
                                                               #11083520                 $      4572.
                                                               #111501                   $    196705.
                                                               #11150110                 $     14746.
                                                               #11150120                 $     15125.
```

```
WCFP08                                                                                           PAGE    9
                                                                        #11150130              $      7274.
                                                                        #111701                $     91603.
                                                                        #11170110              $     13791.
                                                                        #11170120              $      3356.
                                                                        #11190210              $      4766.
                                                                        #11190220              $      9487.
                                                                        #111905                $    186369.
                                                                        #11190510              $      9388.
                                                                        #11190520              $     23305.
                                                                        #112204                $    105678.
                                                                        #11220410              $     10593.
                                                                        #11220420              $      5589.
                                                                        #11220430              $      3591.
                                                                        #112205                $    174901.
                                                                        #11220510              $     12552.
                                                                        #11220520              $     13747.
                                                                        #11220530              $      6719.
                                                                        #140000                $    113748.
                                                                        #21050101              $     71671.
                                                                        #22010701              $     54363.
                                                                        #22042201              $     44290.
                                                                        #310000                $      1663.
                                                                        #320000                $       332.

ALLOCATION:  ----------------DONOR ACCOUNTS----------------             ---------------RECIPIENT ACCOUNTS-------------
             ACCOUNT                                OLD BALANCE         ACCOUNT                OLD BALANCE
             #648260                                $     42300.        #11040110              $     17134.
                                                                        #11040210              $      6950.
                                                                        #11040220              $      7462.
                                                                        #11040230              $      4098.
                                                                        #11040710              $     10721.
                                                                        #11040720              $      9272.
                                                                        #11040730              $      4245.
                                                                        #110502                $     53629.
                                                                        #11050210              $      2285.
                                                                        #11050220              $      3933.
                                                                        #11050230              $      2673.
                                                                        #110509                $     56859.
```

```
#11050910                    $      1612.
#11050920                    $      4154.
#11050930                    $      3356.
#110802                      $    176500.
#11080210                    $      4463.
#11080220                    $     14378.
#11080230                    $     12205.
#110803                      $    192356.
#11080310                    $      5526.
#11080320                    $     11191.
#11080330                    $     15309.
#110835                      $     63727.
#11083510                    $      7909.
#11083520                    $      4572.
#111501                      $    196708.
#11150110                    $     14746.
#11150120                    $     15125.
#11150130                    $      7274.
#111701                      $     91603.
#11170110                    $     13791.
#11170120                    $      3356.
#11190210                    $      4756.
#11190220                    $      9457.
#111905                      $    165369.
#11190510                    $      9348.
#11190520                    $     23806.
#112204                      $    106678.
#11220410                    $     10593.
#11220420                    $      5559.
#11220430                    $      3691.
#112205                      $    174901.
#11220510                    $     12552.
#11220520                    $     13747.
#11220530                    $      6719.
#140000                      $    113796.
#21050101                    $     71671.
#22010701                    $     54363.
#22042201                    $     44290.
#310000                      $      1663.
#320000                      $       352.
```

```
WCFP08                                                                                                PAGE  11
          ACCOUNT                         NEW BALANCE                    ACCOUNT                   NEW BALANCE
          #648260                         $          0.                  #11040110                 $     18927.
                                                                         #11040210                 $      7581.
                                                                         #11040220                 $      8563.
                                                                         #11040230                 $      4333.
                                                                         #11040710                 $     11600.
                                                                         #11040720                 $      9970.
                                                                         #11040730                 $      4504.
                                                                         #110502                   $     53629.
                                                                         #11050210                 $      2524.
                                                                         #11050220                 $      4470.
                                                                         #11050230                 $      2990.
                                                                         #110509                   $     56559.
                                                                         #11050910                 $      1836.
                                                                         #11050920                 $      4680.
                                                                         #11050930                 $      3711.
                                                                         #110802                   $    176500.
                                                                         #11080210                 $      5151.
                                                                         #11080220                 $     16546.
                                                                         #11080230                 $     13519.
                                                                         #110803                   $    192356.
                                                                         #11080310                 $      5633.
                                                                         #11080320                 $     12747.
                                                                         #11080330                 $     17190.
                                                                         #110835                   $     63727.
                                                                         #11083510                 $     10875.
                                                                         #11083520                 $      5057.
                                                                         #111501                   $    146708.
                                                                         #11150110                 $     17140.
                                                                         #11150120                 $     17411.
                                                                         #11150130                 $      8193.
                                                                         #111701                   $     91623.
                                                                         #11170110                 $     15795.
                                                                         #11170120                 $      3365.
                                                                         #11190210                 $      5203.
                                                                         #11190220                 $     10196.
                                                                         #111905                   $    186369.
                                                                         #11190510                 $     10147.
                                                                         #11190520                 $     24797.
                                                                         #112204                   $    106678.
```

```
                                                            #11220410                   $     12261.
                                                            #11220420                   $      6401.
                                                            #11220430                   $      4155.
                                                            #112205                     $    174901.
                                                            #11220510                   $     14620.
                                                            #11220520                   $     15639.
                                                            #11220530                   $      7595.
                                                            #140000                     $    116377.
                                                            #21050101                   $     71571.
                                                            #22010701                   $     54363.
                                                            #22042201                   $     44290.
                                                            #310000                     $      2659.
                                                            #320000                     $       382.

ALLOCATION:  ---------------DONOR ACCOUNTS---------------   ---------------RECIPIENT ACCOUNTS--------------
             ACCOUNT                       OLD BALANCE      ACCOUNT                     OLD BALANCE
             #648253                       $     18600.     #11040110                   $     18927.
                                                            #11040210                   $      7581.
                                                            #11040220                   $      3553.
                                                            #11040230                   $      4333.
                                                            #11040710                   $     11600.
                                                            #11040720                   $      9970.
                                                            #11040730                   $      4504.
                                                            #110502                     $     53629.
                                                            #11050210                   $      2624.
                                                            #11050220                   $      4470.
                                                            #11050230                   $      2990.
                                                            #110509                     $     55559.
                                                            #11050910                   $      1636.
                                                            #11050920                   $      4630.
                                                            #11050930                   $      3711.
                                                            #110802                     $    176500.
                                                            #11080210                   $      5151.
                                                            #11080220                   $     16546.
                                                            #11080230                   $     13819.
                                                            #110803                     $    192356.
                                                            #11080310                   $      6693.
                                                            #11080320                   $     12747.
```

```
WCFP08                                                                      PAGE  13
                                                   #11080330                 $      17190.
                                                   #110835                   $      63727.
                                                   #11083510                 $      10575.
                                                   #11083520                 $       5057.
                                                   #111501                   $     196708.
                                                   #11150110                 $      17140.
                                                   #11150120                 $      17411.
                                                   #11150130                 $       8183.
                                                   #111701                   $      91603.
                                                   #11170110                 $      15985.
                                                   #11170120                 $       3565.
                                                   #11190210                 $       5203.
                                                   #11190220                 $      10196.
                                                   #111905                   $     136269.
                                                   #11190510                 $      10147.
                                                   #11190520                 $      24797.
                                                   #112204                   $     196576.
                                                   #11220410                 $      12261.
                                                   #11220420                 $       6431.
                                                   #11220430                 $       4155.
                                                   #112205                   $     174301.
                                                   #11220510                 $      14620.
                                                   #11220520                 $      15539.
                                                   #11220530                 $       7585.
                                                   #140000                   $     116377.
                                                   #21050101                 $      71671.
                                                   #22010701                 $      54363.
                                                   #22042201                 $      44290.
                                                   #310000                   $       2659.
                                                   #320000                   $        382.
      ACCOUNT                NEW BALANCE           ACCOUNT                   NEW BALANCE
      #648253                $          0.         #11040110                 $      19265.
                                                   #11040210                 $       7939.
                                                   #11040220                 $       3920.
                                                   #11040230                 $       4690.
                                                   #11040710                 $      11957.
                                                   #11040720                 $      10327.
                                                   #11040730                 $       4862.
                                                   #110502                   $      53957.
```

```
WCFP08                                                      PAGE  14
                                  #11050210              $      2982.
                                  #11050220              $      4628.
                                  #11050230              $      3345.
                                  #110509                $     57217.
                                  #11050910              $      2193.
                                  #11050920              $      5034.
                                  #11050930              $      4063.
                                  #110802                $    176553.
                                  #11080210              $      5509.
                                  #11080220              $     16904.
                                  #11080230              $     14177.
                                  #110803                $    192714.
                                  #11080310              $      7040.
                                  #11080320              $     13105.
                                  #11080330              $     17548.
                                  #110835                $     64035.
                                  #11083510              $     11233.
                                  #11083520              $      5415.
                                  #111501                $    197066.
                                  #11150110              $     17496.
                                  #11150120              $     17769.
                                  #11150130              $      8540.
                                  #111701                $     91961.
                                  #11170110              $     10343.
                                  #11170120              $      4223.
                                  #11190210              $      9560.
                                  #11190220              $     10594.
                                  #111905                $    186727.
                                  #11190510              $     10505.
                                  #11190520              $     25155.
                                  #112204                $    107036.
                                  #11220410              $     12619.
                                  #11220420              $      6759.
                                  #11220430              $      4513.
                                  #112205                $    175259.
                                  #11220510              $     14977.
                                  #11220520              $     16197.
                                  #11220530              $      7942.
                                  #140000                $    116734.
                                  #21050101              $     72029.
```

```
WCFP09                                                                                        PAGE  15
                                                                  #22010701                $     54721.
                                                                  #22042201                $     44548.
                                                                  #310000                  $      3017.
                                                                  #320000                  $       740.

ALLOCATION:  ----------------DONOR ACCOUNTS----------------       --------------RECIPIENT ACCOUNTS--------------
             ACCOUNT                          OLD BALANCE         ACCOUNT                  OLD BALANCE
             #649251                          $     3460.         #11040110                $     19265.
             #649252                          $     8245.         #11040210                $      7339.
                                                                  #11040220                $      8920.
                                                                  #11040230                $      4690.
                                                                  #11040710                $     11957.
                                                                  #11040720                $     10327.
                                                                  #11040730                $      4862.
                                                                  #110502                  $     53967.
                                                                  #11050210                $      2952.
                                                                  #11050220                $      4828.
                                                                  #11050230                $      3346.
                                                                  #110509                  $     57217.
                                                                  #11050910                $      2193.
                                                                  #11050920                $      5038.
                                                                  #11050930                $      4055.
                                                                  #110802                  $    175556.
                                                                  #11080210                $      5509.
                                                                  #11080220                $     16904.
                                                                  #11080230                $     14177.
                                                                  #110803                  $    192714.
                                                                  #11080310                $      7040.
                                                                  #11080320                $     13135.
                                                                  #11080330                $     17548.
                                                                  #110835                  $     64085.
                                                                  #11083510                $     11233.
                                                                  #11083520                $      5415.
                                                                  #111501                  $    197066.
                                                                  #11150110                $     17495.
                                                                  #11150120                $     17769.
                                                                  #11150130                $      6540.
                                                                  #111701                  $     91961.
```

```
                                                                 #11170110             $     16343.
                                                                 #11170120             $      4223.
                                                                 #11190210             $      5560.
                                                                 #11190220             $     10554.
                                                                 #111905               $    186727.
                                                                 #11190510             $     10505.
                                                                 #11190520             $     25155.
                                                                 #112204               $    107036.
                                                                 #11220410             $     12619.
                                                                 #11220420             $      6759.
                                                                 #11220430             $      4513.
                                                                 #112205               $    175259.
                                                                 #11220510             $     14977.
                                                                 #11220520             $     16197.
                                                                 #11220530             $      7942.
                                                                 #140000               $    116734.
                                                                 #21050101             $     72029.
                                                                 #22010701             $     54721.
                                                                 #22042201             $     44648.
                                                                 #310000               $      3017.
                                                                 #320000               $       740.
        ACCOUNT                    NEW BALANCE                   ACCOUNT               NEW BALANCE
        #648251                    $          0.                 #11040110             $     19761.
        #648252                    $          0.                 #11040210             $      5105.
                                                                 #11040220             $      9067.
                                                                 #11040230             $      4758.
                                                                 #11040710             $     12201.
                                                                 #11040720             $     10521.
                                                                 #11040730             $      4934.
                                                                 #110502               $     53967.
                                                                 #11050210             $      3076.
                                                                 #11050220             $      4977.
                                                                 #11050230             $      3436.
                                                                 #110509               $     57217.
                                                                 #11050910             $      2255.
                                                                 #11050920             $      5164.
                                                                 #11050930             $      4166.
                                                                 #110802               $    175558.
                                                                 #11080210             $      5695.
```

```
WCFP08                                                                                      PAGE  17
                                                              #11080220                 $      17503.
                                                              #11080230                 $      14623.
                                                              #110903                   $     192714.
                                                              #11080310                 $       7277.
                                                              #11080320                 $      13535.
                                                              #11080330                 $      18068.
                                                              #110835                   $      64045.
                                                              #11083510                 $      12054.
                                                              #11083520                 $       5549.
                                                              #111501                   $     197066.
                                                              #11150110                 $      18160.
                                                              #11150120                 $      13401.
                                                              #11150130                 $       8792.
                                                              #111701                   $      91951.
                                                              #11170110                 $      16950.
                                                              #11170120                 $       4364.
                                                              #11190210                 $       5591.
                                                              #11190220                 $      10750.
                                                              #111905                   $     136727.
                                                              #11190510                 $      10715.
                                                              #11190520                 $      25429.
                                                              #112204                   $     107036.
                                                              #11220410                 $      13030.
                                                              #11220420                 $       6983.
                                                              #11220430                 $       4542.
                                                              #112205                   $     175259.
                                                              #11220510                 $      15549.
                                                              #11220520                 $      16775.
                                                              #11220530                 $       8122.
                                                              #140000                   $     117444.
                                                              #21050101                 $      72329.
                                                              #22010701                 $      54721.
                                                              #22042201                 $      44648.
                                                              #310000                   $       3287.
                                                              #320000                   $        740.

ALLOCATION:  ----------------DONOR ACCOUNTS----------------    ---------------RECIPIENT ACCOUNTS--------------
             ACCOUNT                          OLD BALANCE      ACCOUNT                           OLD BALANCE
```

```
        #848170                 $     31446.              #11040110                 $     19781.
                                                          #11040210                 $      8105.
                                                          #11040220                 $      9067.
                                                          #11040230                 $      4756.
                                                          #11040710                 $     12201.
                                                          #11040720                 $     10521.
                                                          #11040730                 $      4934.
                                                          #110502                   $     53987.
                                                          #11050210                 $      3076.
                                                          #11050220                 $      4977.
                                                          #11050230                 $      3436.
                                                          #110509                   $     57217.
                                                          #11050910                 $      2255.
                                                          #11050920                 $      5184.
                                                          #11050930                 $      4165.
                                                          #110802                   $    176555.
                                                          #11080210                 $      5659.
                                                          #11080220                 $     17503.
                                                          #11080230                 $     14523.
                                                          #110803                   $    192714.
                                                          #11080310                 $      7277.
                                                          #11080320                 $     13535.
                                                          #11080330                 $     15066.
                                                          #110835                   $     64055.
                                                          #11083510                 $     12054.
                                                          #11083520                 $      5549.
                                                          #111501                   $    197066.
                                                          #11150110                 $     18160.
                                                          #11150120                 $     18401.
                                                          #11150130                 $      8792.
                                                          #111701                   $     91561.
                                                          #11170110                 $     16950.
                                                          #11170120                 $      4364.
                                                          #11190210                 $      5661.
                                                          #11190220                 $     10756.
                                                          #111905                   $    165727.
                                                          #11190510                 $     10715.
                                                          #11190520                 $     25429.
                                                          #112204                   $    167036.
                                                          #11220410                 $     13350.
```

```
                                                           #11220420              $      6983.
                                                           #11220430              $      4642.
                                                           #112205                $    175259.
                                                           #11220510              $     15549.
                                                           #11220520              $     16775.
                                                           #11220530              $      6182.
                                                           #140000                $    117446.
                                                           #21050101              $     72029.
                                                           #22010701              $     54721.
                                                           #22042201              $     44646.
                                                           #310000                $      3267.
                                                           #320000                $       740.
     ACCOUNT               NEW BALANCE                     ACCOUNT                NEW BALANCE
     #648170               $         0.                    #11040110              $     21015.
                                                           #11040210              $      6518.
                                                           #11040220              $      9499.
                                                           #11040230              $      4902.
                                                           #11040710              $     12804.
                                                           #11040720              $     11001.
                                                           #11040730              $      5086.
                                                           #110502                $     53937.
                                                           #11050210              $      3356.
                                                           #11050220              $      5420.
                                                           #11050230              $      3697.
                                                           #110509                $     57217.
                                                           #11050910              $      2440.
                                                           #11050920              $      5618.
                                                           #11050930              $      4459.
                                                           #110602                $    176658.
                                                           #11060210              $      6267.
                                                           #11060220              $     19293.
                                                           #11060230              $     15955.
                                                           #110603                $    192714.
                                                           #11060310              $      7934.
                                                           #11060320              $     14520.
                                                            11060330              $     19620.
                                                           #110635                $     64065.
                                                           #11063510              $     13276.
                                                           #11063520              $      5749.
```

```
                                                                          #111501                                       $    197066.
                                                                          #11150110                                     $     20136.
                                                                          #11150120                                     $     20286.
                                                                          #11150130                                     $      9541.
                                                                          #111701                                       $     91361.
                                                                          #11170110                                     $     15761.
                                                                          #11170120                                     $      4764.
                                                                          #11190210                                     $      5977.
                                                                          #11190220                                     $     11200.
                                                                          #111905                                       $    166727.
                                                                          #11190510                                     $     11265.
                                                                          #11190520                                     $     26100.
                                                                          #112204                                       $    107036.
                                                                          #11220410                                     $     14457.
                                                                          #11220420                                     $      7593.
                                                                          #11220430                                     $      5025.
                                                                          #112205                                       $    175259.
                                                                          #11220510                                     $     17255.
                                                                          #11220520                                     $     18501.
                                                                          #11220530                                     $      8696.
                                                                          #140000                                       $    119515.
                                                                          #21060101                                     $     72030.
                                                                          #22012701                                     $     54721.
                                                                          #22042201                                     $     44048.
                                                                          #310000                                       $      3267.
                                                                          #320000                                       $       740.

ALLOCATION:  ----------------DONOR ACCOUNTS----------------              ---------------RECIPIENT ACCOUNTS---------------
             ACCOUNT                             OLD BALANCE              ACCOUNT                                       OLD BALANCE
             #638220                             $     68303.             #11040110                                     $     21015.
                                                                          #11040210                                     $      8513.
                                                                          #11040220                                     $      9449.
                                                                          #11040230                                     $      4902.
                                                                          #11040710                                     $     12804.
                                                                          #11040720                                     $     11001.
                                                                          #11040730                                     $      5086.
                                                                          #110502                                       $     53937.
                                                                          #11050210                                     $      3356.
```

```
WCFP08                                                                                                  PAGE  21
                                                                      #11050220                     $      5420.
                                                                      #11050230                     $      3697.
                                                                      #110509                       $     57217.
                                                                      #11050910                     $      2440.
                                                                      #11050920                     $      5616.
                                                                      #11050930                     $      4459.
                                                                      #110802                       $    176856.
                                                                      #11080210                     $      6267.
                                                                      #11080220                     $     19293.
                                                                      #11080230                     $     15955.
                                                                      #110803                       $    192814.
                                                                      #11080310                     $      7984.
                                                                      #11080320                     $     14820.
                                                                      #11080330                     $     14620.
                                                                      #110835                       $     64065.
                                                                      #11083510                     $     13276.
                                                                      #11083520                     $      5749.
                                                                      #111501                       $    197068.
                                                                      #11150110                     $     20136.
                                                                      #11150120                     $     20269.
                                                                      #11150130                     $      9541.
                                                                      #111701                       $     91961.
                                                                      #11170110                     $     16751.
                                                                      #11170120                     $      4784.
                                                                      #11190210                     $      5977.
                                                                      #11190220                     $     11200.
                                                                      #111905                       $    155727.
                                                                      #11190510                     $     11265.
                                                                      #11190520                     $     26100.
                                                                      #112204                       $    107036.
                                                                      #11220410                     $     14457.
                                                                      #11220420                     $      7653.
                                                                      #11220430                     $      5025.
                                                                      #112205                       $    175259.
                                                                      #11220510                     $     17255.
                                                                      #11220520                     $     16501.
                                                                      #11220530                     $      6396.
                                                                      #140000                       $    119512.
     ACCOUNT                        NEW BALANCE                       ACCOUNT                       NEW BALANCE
```

```
WCFP08

          #638220                                                                                PAGE  22
                                                  #11040110                              $      23694.
                                                  #11040210                              $       9414.
                                                  #11040220                              $      10396.
                                                  #11040230                              $       5217.
                                                  #11040710                              $      14115.
                                                  #11040720                              $      12045.
                                                  #11040730                              $       5417.
                                                  #110502                                $      53987.
                                                  #11050210                              $       3965.
                                                  #11050220                              $       6394.
                                                  #11050230                              $       4266.
                                                  #110509                                $      57217.
                                                  #11050910                              $       2641.
                                                  #11050920                              $       6561.
                                                  #11050930                              $       5095.
                                                  #110802                                $     176658.
                                                  #11080210                              $       7502.
                                                  #11080220                              $      23179.
                                                  #11080230                              $      18848.
                                                  #110303                                $     192714.
                                                  #11080310                              $       9519.
                                                  #11080320                              $      17609.
                                                  #11080330                              $      22992.
                                                  #110835                                $      64085.
                                                  #11083510                              $      15937.
                                                  #11083520                              $       6164.
                                                  #111501                                $     197066.
                                                  #11150110                              $      24427.
                                                  #11150120                              $      24335.
                                                  #11150130                              $      11170.
                                                  #111701                                $      91961.
                                                  #11170110                              $      22694.
                                                  #11170120                              $       5697.
                                                  #11190210                              $       6619.
                                                  #11190220                              $      12176.
                                                  #111905                                $     186727.
                                                  #11190510                              $      12459.
                                                  #11190520                              $      27559.
                                                  #112204                                $     107036.
                                                  #11220410                              $      17447.
```

```
WCFP08                                                                                          PAGE  23
                                                                     #11220420                $     9106.
                                                                     #11220430                $     5358.
                                                                     #112205                  $   175259.
                                                                     #11220510                $    20961.
                                                                     #11220520                $    22251.
                                                                     #11220530                $    10448.
                                                                     #140000                  $   123995.

ALLOCATION:  ---------------DONOR ACCOUNTS---------------           --------------RECIPIENT ACCOUNTS--------------
              ACCOUNT                          OLD BALANCE           ACCOUNT                  OLD BALANCE
              #638160                          $    14688.           #11040110                $    23694.
                                                                     #11040210                $     9414.
                                                                     #11040220                $    10376.
                                                                     #11040230                $     5217.
                                                                     #11040710                $    14115.
                                                                     #11040720                $    12045.
                                                                     #11040730                $     5417.
                                                                     #110502                  $    53467.
                                                                     #11050210                $     3965.
                                                                     #11050220                $     6384.
                                                                     #11050230                $     4266.
                                                                     #110509                  $    57217.
                                                                     #11050910                $     2341.
                                                                     #11050920                $     6561.
                                                                     #11050930                $     5095.
                                                                     #110802                  $   175558.
                                                                     #11080210                $     7502.
                                                                     #11080220                $    23179.
                                                                     #11080230                $    18846.
                                                                     #110803                  $   192714.
                                                                     #11080310                $     9519.
                                                                     #11080320                $    17609.
                                                                     #11080330                $    22992.
                                                                     #110835                  $    64055.
                                                                     #11083510                $    15937.
                                                                     #11083520                $     4144.
                                                                     #111501                  $   197066.
                                                                     #11150110                $    24427.
```

```
WCFP08                                                                                  PAGE  24
                                                              #11150120           $      24385.
                                                              #11150130           $      11170.
                                                              #111701             $      91951.
                                                              #11170110           $      22594.
                                                              #11170120           $       5697.
                                                              #11190210           $       6619.
                                                              #11190220           $      12176.
                                                              #111905             $      36727.
                                                              #11190510           $      12459.
                                                              #11190520           $      27559.
                                                              #112204             $     107038.
                                                              #11220410           $      17447.
                                                              #11220420           $       9108.
                                                              #11220430           $       5658.
                                                              #112205             $     175259.
                                                              #11220510           $      20961.
                                                              #11220520           $      22251.
                                                              #11220530           $      10448.
                                                              #140000             $     123998.
                                                              #21050101           $      72030.
                                                              #22010701           $      54721.
                                                              #22042201           $      44648.
                                                              #310000             $       3267.
                                                              #320000             $        740.
        ACCOUNT                 NEW BALANCE                   ACCOUNT             NEW BALANCE
        #638160                 $         0                   #11040110           $      24270.
                                                              #11040210           $       9607.
                                                              #11040220           $      10569.
                                                              #11040230           $       5265.
                                                              #11040710           $      14397.
                                                              #11040720           $      12269.
                                                              #11040730           $       5468.
                                                              #110502             $      53987.
                                                              #11050210           $       4096.
                                                              #11050220           $       6591.
                                                              #11050230           $       4338.
                                                              #110509             $      57217.
                                                              #11050910           $       2928.
                                                              #11050920           $       6764.
```

```
WCFP08                                                          PAGE  25

                                  #11050930              $      5231.
                                  #110802                $    176958.
                                  #11080210              $      7767.
                                  #11080220              $     24015.
                                  #11080230              $     19470.
                                  #110803                $    192714.
                                  #11080310              $      9850.
                                  #11080320              $     18209.
                                  #11080330              $     23717.
                                  #110835                $     54065.
                                  #11083510              $     15509.
                                  #11083520              $      6277.
                                  #111501                $    197066.
                                  #11150110              $     25350.
                                  #11150120              $     25266.
                                  #11150130              $     11521.
                                  #111701                $     91951.
                                  #11170110              $     23540.
                                  #11170120              $      5593.
                                  #11190210              $      6757.
                                  #11190220              $     12386.
                                  #111905                $    186727.
                                  #11190510              $     12716.
                                  #11190520              $     27372.
                                  #112204                $    107636.
                                  #11220410              $     18090.
                                  #11220420              $      9421.
                                  #11220430              $      6037.
                                  #112205                $    175239.
                                  #11220510              $     21758.
                                  #11220520              $     23057.
                                  #11220530              $     10762.
                                  #140000                $    124963.
                                  #22050101              $     72030.
                                  #22010701              $     94721.
                                  #22042201              $     44648.
                                  #310000                $      3267.
                                  #320000                $       740.
```

```
WCFP08                                                                                                    PAGE  26

ALLOCATION:  ----------------DONOR ACCOUNTS----------------          ---------------RECIPIENT ACCOUNTS---------------
             ACCOUNT                           OLD BALANCE          ACCOUNT                            OLD BALANCE
             #528210                           $     52941.         #11040110                          $     24270.
                                                                    #11040210                          $      9607.
                                                                    #11040220                          $     10569.
                                                                    #11040230                          $      5265.
                                                                    #11040710                          $     14397.
                                                                    #11040720                          $     12269.
                                                                    #11040730                          $      5488.
                                                                    #110502                            $     53967.
                                                                    #11050210                          $      4096.
                                                                    #11050220                          $      6591.
                                                                    #11050230                          $      4356.
                                                                    #110509                            $     57217.
                                                                    #11050910                          $      2928.
                                                                    #11050920                          $      6764.
                                                                    #11050930                          $      5231.
                                                                    #110802                            $    176656.
                                                                    #11080210                          $      7767.
                                                                    #11080220                          $     24015.
                                                                    #11080230                          $     19470.
                                                                    #110803                            $    192714.
                                                                    #11080310                          $      9550.
                                                                    #11080320                          $     18209.
                                                                    #11080330                          $     23717.
                                                                    #110835                            $     64085.
                                                                    #11083510                          $     16509.
                                                                    #11083520                          $      6277.
                                                                    #111501                            $    197086.
                                                                    #11150110                          $     25350.
                                                                    #11150120                          $     25266.
                                                                    #11150130                          $     11521.
                                                                    #111701                            $     91961.
                                                                    #11170110                          $     23540.
                                                                    #11170120                          $      5893.
                                                                    #11190210                          $      6757.
                                                                    #11190220                          $     12386.
                                                                    #111905                            $    196727.
                                                                    #11190510                          $     12716.
                                                                    #11190520                          $     27672.
                                                                    #112204                            $    107036.
```

```
                                                  #11220410            $     18090.
                                                  #11220420            $      9421.
                                                  #11220430            $      6037.
                                                  #112205              $    175259.
                                                  #11220510            $     21758.
                                                  #11220520            $     23057.
                                                  #11220530            $     10782.
                                                  #140000              $    124963.
                                                  #21050101            $     72030.
                                                  #22010701            $    554721.
                                                  #22042201            $     44645.
                                                  #310000              $      3267.
                                                  #320000              $       740.
     ACCOUNT                NEW BALANCE           ACCOUNT              NEW BALANCE
     #628210                $          0.         #11040110            $     25503.
                                                  #11040210            $     10373.
                                                  #11040220            $     11696.
                                                  #11040230            $      6221.
                                                  #11040710            $     15504.
                                                  #11040720            $     13461.
                                                  #11040730            $      6340.
                                                  #110502              $     53987.
                                                  #11050210            $      4375.
                                                  #11050220            $      7243.
                                                  #11050230            $      5009.
                                                  #110509              $     57217.
                                                  #11050910            $      3125.
                                                  #11050920            $      7472.
                                                  #11050930            $      5472.
                                                  #110802              $    176356.
                                                  #11080210            $      8276.
                                                  #11080220            $     26058.
                                                  #11080230            $     22025.
                                                  #110803              $    192714.
                                                  #11080310            $     10516.
                                                  #11080320            $     19579.
                                                  #11080330            $     25946.
                                                  #110835              $     54035.
                                                  #11083510            $     17593.
```

```
                                                          #11083520                          $      6738.
                                                          #111501                            $    147056.
                                                          #11150110                          $     26944.
                                                          #11150120                          $     27543.
                                                          #11150130                          $     13342.
                                                          #111701                            $     91961.
                                                          #11170110                          $     25608.
                                                          #11170120                          $      6477.
                                                          #11190210                          $      7405.
                                                          #11190220                          $     14055.
                                                          #111905                            $    166727.
                                                          #11190510                          $     13741.
                                                          #11190520                          $     29922.
                                                          #112204                            $    107036.
                                                          #11220410                          $     19356.
                                                          #11220420                          $     10376.
                                                          #11220430                          $      6902.
                                                          #112205                            $    175259.
                                                          #11220510                          $     23125.
                                                          #11220520                          $     25133.
                                                          #11220530                          $     12402.
                                                          #140000                            $    127732.
                                                          #21050101                          $     73640.
                                                          #22010701                          $     55168.
                                                          #22042201                          $     45818.
                                                          #310000                            $      3604.
                                                          #320000                            $      1008.

ALLOCATION:  ---------------DONOR ACCOUNTS---------------  ---------------RECIPIENT ACCOUNTS---------------
             ACCOUNT                        OLD BALANCE   ACCOUNT                            OLD BALANCE
             #613130                        $     6750.   #11040110                          $     25803.
                                                          #11040210                          $     10373.
                                                          #11040220                          $     11596.
                                                          #11040230                          $      6221.
                                                          #11040710                          $     15504.
                                                          #11040720                          $     13451.
                                                          #11040730                          $      6340.
                                                          #110502                            $     53987.
```

```
#11050210                        $      4375.
#11050220                        $      7243.
#11050230                        $      5009.
#110509                          $     57217.
#11050910                        $      3125.
#11050920                        $      7472.
#11050930                        $      5972.
#110802                          $    176858.
#11080210                        $      8276.
#11080220                        $     26058.
#11080230                        $     22025.
#110803                          $    192714.
#11080310                        $     10518.
#11080320                        $     16579.
#11080330                        $     26946.
#110835                          $     64065.
#11083510                        $     17693.
#11083520                        $      6738.
#111501                          $    197066.
#11150110                        $     26944.
#11150120                        $     27543.
#11150130                        $     13342.
#111701                          $     91961.
#11170110                        $     25605.
#11170120                        $      6477.
#11190210                        $      7405.
#11190220                        $     14056.
#111905                          $    186727.
#11190510                        $     13741.
#11190520                        $     29922.
#112204                          $    107036.
#11220410                        $     19356.
#11220420                        $     10376.
#11220430                        $      5932.
#112205                          $    175259.
#11220510                        $     22125.
#11220520                        $     25133.
#11220530                        $     12402.
#140000                          $    127732.
#21050101                        $     73640.
```

```
WCFP08                                                                                          PAGE  30
                                                                      #22010701                $    56168.
                                                                      #22042201                $    45813.
                                                                      #310000                  $     3604.
        ACCOUNT                    NEW BALANCE                        #320000                  $     1008.
        #618130                    $          0.                      ACCOUNT                  NEW BALANCE
                                                                      #11040110                $    25998.
                                                                      #11040210                $    10471.
                                                                      #11040220                $    11837.
                                                                      #11040230                $     6341.
                                                                      #11040710                $    15645.
                                                                      #11040720                $    13613.
                                                                      #11040730                $     6448.
                                                                      #110502                  $    53987.
                                                                      #11050210                $     4411.
                                                                      #11050220                $     7326.
                                                                      #11050230                $     5038.
                                                                      #110509                  $    57217.
                                                                      #11050910                $     3150.
                                                                      #11050920                $     7562.
                                                                      #11050930                $     6055.
                                                                      #110302                  $   176858.
                                                                      #11030210                $     8343.
                                                                      #11030220                $    26519.
                                                                      #11030230                $    22330.
                                                                      #110803                  $   192714.
                                                                      #11080310                $    10633.
                                                                      #11080320                $    20092.
                                                                      #11080330                $    27356.
                                                                      #110835                  $    64085.
                                                                      #11083510                $    18069.
                                                                      #11083520                $     5797.
                                                                      #111501                  $   197066.
                                                                      #11150110                $    27147.
                                                                      #11150120                $    27634.
                                                                      #11150130                $    13575.
                                                                      #111701                  $    91961.
                                                                      #11170110                $    25872.
                                                                      #11170120                $     6551.
                                                                      #11190210                $     7437.
```

```
WCFP08                                                                                                        PAGE  31
                                                                                  #11190220                         $     14272.
                                                                                  #111905                           $    186727.
                                                                                  #11190510                         $     13871.
                                                                                  #11190520                         $     30183.
                                                                                  #112204                           $    107036.
                                                                                  #11220410                         $     19517.
                                                                                  #11220420                         $     10500.
                                                                                  #11220430                         $      7012.
                                                                                  #112205                           $    175259.
                                                                                  #11220510                         $     23299.
                                                                                  #11220520                         $     25397.
                                                                                  #11220530                         $     12608.
                                                                                  #140000                           $    124095.
                                                                                  #21050101                         $     74071.
                                                                                  #22010701                         $     56352.
                                                                                  #22042201                         $     45967.
                                                                                  #310000                           $      3712.
                                                                                  #320000                           $      1042.

ALLOCATION:  ----------------DONOR ACCOUNTS----------------                       -------------RECIPIENT ACCOUNTS-------------
             ACCOUNT                             OLD BALANCE                      ACCOUNT                          OLD BALANCE
             #613110                             $   136700.                      #11040110                         $     25999.
             #619120                             $    35483.                      #11040210                         $     10471.
                                                                                  #11040220                         $     11837.
                                                                                  #11040230                         $      6341.
                                                                                  #11040710                         $     15645.
                                                                                  #11040720                         $     13613.
                                                                                  #11040730                         $      6448.
                                                                                  #110502                           $     53987.
                                                                                  #11050210                         $      4411.
                                                                                  #11050220                         $      7326.
                                                                                  #11050230                         $      5038.
                                                                                  #110509                           $     57217.
                                                                                  #11050910                         $      3150.
                                                                                  #11050920                         $      7562.
                                                                                  #11050930                         $      6066.
                                                                                  #110802                           $    176355.
                                                                                  #11080210                         $      6343.
```

```
WCFP08                                                                                      PAGE  32
                                                          #11080220                      $     26319.
                                                          #11080230                      $     22350.
                                                          #110803                        $    192714.
                                                          #11080310                      $     10603.
                                                          #11080320                      $     20092.
                                                          #11080330                      $     27356.
                                                          #110835                        $     64065.
                                                          #11083510                      $     18069.
                                                          #11083520                      $      6797.
                                                          #111501                        $    197066.
                                                          #11150110                      $     27147.
                                                          #11150120                      $     27534.
                                                          #11150130                      $     13575.
                                                          #111701                        $     91961.
                                                          #11170110                      $     25872.
                                                          #11170120                      $      6591.
                                                          #11190210                      $      7487.
                                                          #11190220                      $     14272.
                                                          #111905                        $    186727.
                                                          #11190510                      $     13871.
                                                          #11190520                      $     30183.
                                                          #112204                        $    107036.
                                                          #11220410                      $     19517.
                                                          #11220420                      $     10503.
                                                          #11220430                      $      7012.
                                                          #112205                        $    175259.
                                                          #11220510                      $     23299.
                                                          #11220520                      $     25397.
                                                          #11220530                      $     12608.
                                                          #140000                        $    128085.
                                                          #21050101                      $     74071.
                                                          #22010701                      $     56352.
                                                          #22042201                      $     49967.
                                                          #310000                        $      3712.
                                                          #320000                        $      1042.
       ACCOUNT                  NEW BALANCE               ACCOUNT                        NEW BALANCE
       #618110                  $          0.             #11040110                      $     29309.
       #618120                  $          0.             #11040210                      $     13782.
                                                          #11040220                      $     15148.
```

```
WCFP03                                                          PAGE  33

                                    #11040230              $      9652.
                                    #11040710              $     18957.
                                    #11040720              $     16924.
                                    #11040730              $      9760.
                                    #110502                $     57298.
                                    #11050210              $      7722.
                                    #11050220              $     10637.
                                    #11050230              $      8399.
                                    #110509                $     60525.
                                    #11050910              $      6461.
                                    #11050920              $     10673.
                                    #11050930              $      9377.
                                    #110802                $    180169.
                                    #11080210              $     11654.
                                    #11080220              $     29630.
                                    #11080230              $     25661.
                                    #110803                $    196025.
                                    #11080310              $     13914.
                                    #11080320              $     23403.
                                    #11080330              $     30669.
                                    #110835                $     67396.
                                    #11083510              $     21330.
                                    #11083520              $     10108.
                                    #111501                $    200377.
                                    #11150110              $     30459.
                                    #11150120              $     31145.
                                    #11150130              $     16386.
                                    #111701                $     96272.
                                    #11170110              $     29183.
                                    #11170120              $      9962.
                                    #11190210              $     10798.
                                    #11190220              $     17563.
                                    #111905                $    190038.
                                    #11190510              $     17183.
                                    #11190520              $     33494.
                                    #112204                $    110347.
                                    #11220410              $     22926.
                                    #11220420              $     13611.
                                    #11220430              $     10323.
                                    #112205                $    173570.
```

```
#11220510                           $      26610.
#11220520                           $      26700.
#11220530                           $      15920.
#140000                             $     131398.
#21050101                           $      77362.
#22010701                           $      59664.
#22042201                           $      49278.
#310000                             $       7024.
#320000                             $       4354.
```

```
                                               PCS ACCOUNT BALANCES

               ACCOUNT NUMBER              PARM  1     PARM  2     PARM  3     PARM  4     PARM  5     PARM  6     PARM  7     PARM  8

110401                                     294214.          0.          0.          0.          0.          0.          0.          0.
11040110                                    29309.        801.        961.          4.          3.      52959.         13.       2742.
11040210                                    13782.        268.        322.          2.          1.      26479.          3.       1080.
11040220                                    15148.        268.        322.          2.          1.      38248.          4.       1171.
11040230                                     9652.         94.        131.          1.          0.      32364.          1.        505.
11040710                                    18957.        392.        471.          3.          2.      38248.          5.       1677.
11040720                                    16924.        312.        374.          2.          2.      41190.          5.       1389.
11040730                                     9760.         99.        139.          1.          0.      29421.          1.        556.
110502                                      57298.          0.          0.          0.          0.          0.          0.          0.
11050210                                     7722.        182.        182.          1.          0.       9653.          2.        346.
11050220                                    10637.        283.        288.          1.          1.      22524.          4.        551.
11050230                                     8399.        170.        170.          1.          0.      21452.          3.        328.
110509                                      60528.          0.          0.          0.          0.          0.          0.          0.
11050910                                     6451.        120.        120.          0.          0.       6823.          1.        244.
11050920                                    10873.        282.        282.          1.          1.      24449.          4.        577.
11050930                                     9377.        190.        190.          1.          1.      25587.          4.        422.
110802                                     180169.          0.          0.          0.          0.          0.          0.          0.
11080210                                    11654.        369.        369.          2.          1.      17550.          5.        695.
11080220                                    29630.       1162.       1162.          5.          4.      70600.         17.       2103.
11080230                                    25641.        865.        865.          4.          3.      88250.         15.       1571.
110803                                     196025.          0.          0.          0.          0.          0.          0.          0.
11080310                                    13914.        459.        459.          2.          2.      23083.          7.        894.
11080320                                    23403.        834.        834.          5.          4.      57707.         11.       1616.
11080330                                    30609.       1008.       1008.          6.          4.     111566.         18.       1964.
110835                                      67395.          0.          0.          0.          0.          0.          0.          0.
11083510                                    21380.        795.       1590.          4.          4.      47795.         28.       1069.
11083520                                    10108.        130.        260.          0.          0.      15932.          6.        716.
111501                                     200377.          0.          0.          0.          0.          0.          0.          0.
11150110                                    30459.       1283.       1283.          6.          5.      55078.         15.       2288.
11150120                                    31145.       1225.       1225.          6.          5.      78683.         15.       2179.
11150130                                    16386.        487.        487.          2.          1.      62947.          9.        658.
111701                                      95272.          0.          0.          0.          0.          0.          0.          0.
11170110                                    29183.       1176.       1176.          5.          4.      71450.         14.       1989.
11170120                                     9862.        273.        273.          1.          1.      20153.          3.        463.
11190210                                    10798.        192.        234.          1.          1.      22364.          3.        705.
11190220                                    17583.        292.        380.          3.          2.      57774.          6.       1303.
111905                                     190038.          0.          0.          0.          0.          0.          0.          0.
11190510                                    17183.        357.        407.          3.          2.      35410.          6.       1454.
11190520                                    33494.        436.        530.          4.          3.      70820.          8.       3831.
112204                                     110347.          0.          0.          0.          0.          0.          0.          0.
```

```
                                             PCS ACCOUNT BALANCES

        ACCOUNT NUMBER           PARM 1     PARM 2     PARM 3     PARM 4     PARM 5     PARM 6     PARM 7     PARM 8

11220410                         22828.       694.       894.         4.         3.     43758.        11.      1412.
11220420                         13811.       435.       435.         2.         1.     33070.         6.       775.
11220430                         10323.       249.       249.         1.         1.     29670.         4.       451.
112205                          179570.         0.         0.         0.         0.         0.         0.         0.
11220510                         26610.      1109.      1108.         5.         4.     47223.        13.      1945.
11220520                         23709.      1121.      1121.         5.         4.     71709.        14.      1979.
11220530                         15920.       464.       464.         2.         1.     55968.         8.       809.
140000                          141396.      1341.      1382.         8.         7.     95663.        10.       210.
21050101                         77382.         0.         0.         6.         5.     62549.         0.      1200.
22010701                         59664.         0.         0.         2.         1.     50000.         0.       422.
22042201                         49278.         0.         0.         1.         1.     40415.         0.       405.
310000                            7024.         0.       523.         1.         1.     13045.        21.       210.
320000                            4354.         0.         0.         0.         0.      9270.         0.         0.
410000                          233100.         0.         0.         0.         0.         0.         0.         0.
410060                            3049.         0.         0.         0.         0.         0.         0.         0.
440000                          238259.         0.         0.         0.         0.         0.         0.         0.
460000                          120000.         0.         0.         0.         0.         0.         0.         0.
460040                           40913.         0.         0.         0.         0.         0.         0.         0.
460500                           48200.         0.         0.         0.         0.         0.         0.         0.
460800                           44000.         0.         0.         0.         0.         0.         0.         0.
500000                           30300.         0.         0.         0.         0.         0.         0.         0.
517110                           30600.         0.         0.         0.         0.         0.         0.         0.
517120                           15415.         0.         0.         0.         0.         0.         0.         0.
517140                           52120.         0.         0.         0.         0.         0.         0.         0.
517200                          315690.         0.         0.         0.         0.         0.         0.         0.
520000                           60100.         0.         0.         0.         0.         0.         0.         0.
530000                           41500.         0.         0.         0.         0.         0.         0.         0.
540000                           22200.         0.         0.         0.         0.         0.         0.         0.
557310                          307300.         0.         0.         0.         0.         0.         0.         0.
557320                           78800.         0.         0.         0.         0.         0.         0.         0.
557330                          251300.         0.         0.         0.         0.         0.         0.         0.
557340                          162010.         0.         0.         0.         0.         0.         0.         0.
618110                               0.         0.         0.         0.         0.         0.         0.         0.
618120                               0.         0.         0.         0.         0.         0.         0.         0.
618130                               0.         0.         0.         0.         0.         0.         0.         0.
628210                               0.         0.         0.         0.         0.         0.         0.         0.
636160                               0.         0.         0.         0.         0.         0.         0.         0.
638220                               0.         0.         0.         0.         0.         0.         0.         0.
648170                               0.         0.         0.         0.         0.         0.         0.         0.
648251                               0.         0.         0.         0.         0.         0.         0.         0.
```

```
                                         PCS ACCOUNT BALANCES

          ACCOUNT NUMBER            PARM  1    PARM  2    PARM  3    PARM  4    PARM  5    PARM  6    PARM  7    PARM  8

648252                                   0.         0.         0.         0.         0.         0.         0.         0.
648253                                   0.         0.         0.         0.         0.         0.         0.         0.
648260                                   0.         0.         0.         0.         0.         0.         0.         0.
658310                                   0.         0.         0.         0.         0.         0.         0.         0.
658320                                   0.         0.         0.         0.         0.         0.         0.         0.
658340                                   0.         0.         0.         0.         0.         0.         0.         0.
678100                                   0.         0.         0.         0.         0.         0.         0.         0.
                                 ---------- ---------- ---------- ---------- ---------- ---------- ---------- ----------
         PARAMETER TOTALS          4702088.     20421.     22670.       117.        87.   1829179.       323.     47316.
```

APPENDIX F

UNIT COSTS OF INSTRUCTION: A METHODOLOGICAL APPROACH

APPENDIX F

THE NATIONAL CENTER FOR HIGHER EDUCATION
MANAGEMENT SYSTEMS
(NCHEMS)
AT WICHE

UNIT COSTS OF INSTRUCTION:
A METHODOLOGICAL APPROACH

By Warren W. Gulko

1971

Note: This is a preliminary edition and is subject to change by the Information Exchange Procedures Task Force and Technical Council.

PREFACE

This technical paper presents a proposed methodology for computing unit costs of instruction in higher education. It has been developed over the past twelve months as an outgrowth of work on the Program Classification Structure. The proposed methodology has been subjected to critical review by selected members of the WICHE Planning and Management Systems Program Advisory Structure. It is now being distributed as a preliminary draft in order to receive wide-scale review by all participants in the WICHE Planning and Management Systems Program and to stimulate thinking about the difficult task of computing unit costs of instruction in higher education.

The level of presentation is targeted for the technically-oriented cost analyst concerned with mathematically deriving unit cost data. Although portions of the text are presented algebraically, each mathematical expression is explained to aid the reader in understanding the proposed methodology. Management personnel involved with using unit cost data will benefit from reviewing this technical paper.

The WICHE Planning and Management System (PMS) Program is a cooperative venture of over 500 institutions and agencies to develop new management technologies for higher education. The methodology of deriving unit cost information will play an important part in the information exchange phase of the PMS Program. We urge all participants in the PMS Program to review this document and forward their comments, criticisms, and suggestions directly to the author or members of the Staff.

Ben Lawrence, Director
Planning and Management Systems Division

TABLE OF CONTENTS

ACKNOWLEDGMENT vi

INTRODUCTION 1

SECTION I: Overview 3

SECTION II: Algebra of Unit Costs 18

SECTION III: Theoretical Degree Cost for One Student 27

SECTION IV: The Extension to n Students: Cost per Degree-Winner 34

SECTION V: An Empirical Study 43

SECTION VI: Estimating Future Costs 53

APPENDIX: Glossary of Notation 58

BIBLIOGRAPHY 59

LIST OF ILLUSTRATIONS

FIGURE 1 EXAMPLE OF A DISCIPLINE INSTRUCTION EXPENDITURE MATRIX, $D = \{d_{ij}\}$ 10

FIGURE 2 EXAMPLE OF A DISCIPLINE INSTRUCTION STUDENT CREDIT HOUR MATRIX, $U = \{u_{ij}\}$ 12

FIGURE 3 EXAMPLE OF A DISCIPLINE INSTRUCTION UNIT COST MATRIX, $C = \{c_{ij}\}$ 13

FIGURE 4 EXAMPLE OF A CREDIT DISTRIBUTION MATRIX, $V = \{v_{ijks}\}$ 14

FIGURE 5 EXAMPLE OF AN INDUCED COURSE-LOAD MATRIX, $\bar{V} = \{\bar{v}_{ijks}\}$ 16

FIGURE 6 EXAMPLE OF A UNIT COST ANALYSIS REPORT 42

FIGURE 7 CREDIT DISTRIBUTION MATRIX FOR EMPIRICAL STUDY, $e_{ij}(t)$ 44

FIGURE 8 TABLE OF $c_{ij}(t)$ 45

FIGURE 9 TABLE OF $a_{ij}(t)$ and $\bar{f}(t)$ 48

FIGURE 10 SUMMARY OF ESTIMATED DEGREE COST BY STUDENT 49

FIGURE 11 DETAIL ESTIMATED COST BY STUDENT 50

FIGURE 12 EXAMPLE OF A DEGREE PROFILE MATRIX, $\bar{e}_{ij}(t)$ 54

ACKNOWLEDGMENT

The author acknowledges gratefully the assistance and editorial review by all those who graciously contributed their time and efforts toward the development of this technical paper. In particular, the members of the former WICHE Planning and Management Systems Analytical Task Force and the Technical Council ad hoc Review Committee contributed substantively to the paper:

Dr. Robert F. Adams
University of California
Santa Cruz

Mr. Denis Curry
Washington Council on
Higher Education

Mr. James Eden
University of Rochester
New York

Mr. James Farmer
The California State
Colleges

Mr. John E. Keller
University of California

Dr. Thomas R. Mason
University of Colorado

Mr. M. Charles McIntyre
California Community Colleges

Mr. Gordon D. Osborn
State University of New York

Mr. Garland P. Peed
State Center Junior College District

Mr. James F. Ryan
University of Washington

Dr. Robert A. Wallhaus
University of Illinois

Dr. George B. Weathersby
University of California

Dr. Martin L. Zeigler
University of Illinois

Significant contributions to the conceptualization and computer programming were made by Mr. James S. Martin and Mr. Charles R. Thomas of the WICHE PMS Staff. In addition, the following individuals reviewed the paper and made many suggestions which were valuable to the development of the methodology: Professor William Ammentorp, Professor Gary Andrew,

and Mr. Dave Berg at the University of Minnesota; Mr. Peter J. Czajkowski, University of Illinois; Dr. Robert Lamson, University of Washington; and Mr. Roger L. Sisson, Government Studies and Systems. The author is solely responsible for any errors or omissions.

UNIT COSTS OF INSTRUCTION: A Methodological Approach

INTRODUCTION

This technical paper has been developed to suggest a preliminary basis for the exchange of comparable unit cost information which will aid in the analysis of higher education expenditures. A necessary part of such information exchange is a standard taxonomy or uniform classification system which identifies and categorizes the activities of the programs of higher education in a consistent manner. One such system has been developed in a preliminary form and distributed to the institutions and agencies participating in the WICHE Planning and Management Systems program - the Program Classification Structure.[1] This paper extends the application of the Program Classification Structure to what may be the singularly most significant aspect of higher education expenditures, the instruction program.[2] The sections following provide a general overview of unit cost analysis and a proposal for a specific algebraic formulation which is compatible with Program Classification Structure. The application of the proposed approach to determine historical unit costs is demonstrated through an empirical study. An application to the estimation of future unit costs is described briefly in relation to the WICHE Resource Requirements Prediction Model (RRPM-1).

---

[1] Warren W. Gulko, Program Classification Structure: Preliminary Edition (Boulder, Colorado: Western Interstate Commission for Higher Education, June, 1970).

[2] John Dale Russell and James I. Doi, "Analysis of Expenditures for Instruction" College and University Business, Vol. 20, No. 4, April, 1956.

The term "cost" has many interpretations, particularly in the area of education. For the purposes of this paper, the interpretation of the term "cost" is based upon Anthony's definition: "Cost measures the use of resources",[3] as applied specifically to institutional resources. The paper is concerned with direct and indirect cost but does not address the question of defining what are appropriate indirect costs, nor is it concerned with allocation procedures for attributing support costs to the instruction program. Such allocation procedures are the subject of a study[4] currently underway within the Planning and Management Systems program and will be published separately.

---

[3] Robert Anthony, "What Should 'Cost' Mean?", Harvard Business Review, 48:3, May-June 1970, p. 126.

[4] The Cost Finding Principles Project under the direction of Mr. Michael Young.

SECTION I

Overview

One of the more commonly used measures for analysis of higher education programs is the unit cost of instruction in terms of students, credit hours, degrees, etc. Such measures are useful for evaluating the resource requirements of an operation and comparing the relative institutional costs of various programs. Although unit cost data in higher education does not have the same economic meaning as its industrial counterpart (i.e., it does not mean the unit cost of production), the connotation of production cost has caused some academicians to reject the concept. For example, Cavanaugh[5] recently commented:

> The influence of this terminology has, I believe, had a very negative effect on the use of cost analysis data. On the one hand it gives the mistaken impression to academic administrators that, within its proper context, unit-cost data has a validity in higher education comparable to that of analytical cost data in business and industry. This is simply not so. The comparison is at best an analogous one; the very best unit-cost information in education does not even approach the significance and usefulness of cost data in profit-seeking organizations. It does not provide a firm basis from which to control expenditures, nor can it be used to put a value on the 'product'. Even in proper context it is the wrong term: 'unit-expenditure' is far more accurate. The terminology also is repellent to many academicians, and hardly flattering to the best instruction and research to be found in the universities and colleges. Because of this, it is

---

[5] Alfred D. Cavanaugh, A Preliminary Evaluation of Cost Studies in Higher Education (Office of Institutional Research, University of California, Berkeley, October 1969).

> ignored by many influential individuals within the academic decision-making structure. This is quite unfortunate because, with all its shortcomings, unit-cost information is an important and probably essential adjunct to informed decision-making.

Although Cavanaugh's comments are appropriate to specific instances, it is not the general case that cost analysis is universally ignored by higher education management. Rather, the application of cost analysis to higher education is gaining wider acceptance in the academic community. Miller, in his study of formulas and cost analysis, reported a trend toward quantitative analysis of higher education expenditures, and predicted that "most states will be affected by this trend."[6] Miller's conclusion five years ago is verified today by the widespread national interest in the WICHE Planning and Management System program.[7] However, dissatisfaction with cost studies has resulted from misuse of the data and the lack of consistent definitions and methodology. As Russell and Doi[8] observed:

> The unit cost technic has been criticized extensively and severely. If the method were to be judged solely on the volume and the vehemence of the criticisms against it, probably no one in his right mind would ever use it. But, curiously, wise and prudent administrators continued to find advantages in the use of unit cost data. And people outside the official family of the institution almost invariably insist on translating its published financial

---

[6] James L. Miller, Jr., State Budgeting for Higher Education: The Use of Formulas and Cost Analysis (Michigan Governmental Studies No. 45, Institute of Public Administration, The University of Michigan, 1965, p. 150).

[7] Over 500 institutions and agencies from all fifty states are now participating in this program to apply the tools of economics and management science to higher education.

[8] John Dale Russell and James I. Doi, "Analysis of Institutional Expenditures" (College and University Business, Vol. 19, No. 3, September 1955).

data into some kind of unit terms, often not making such calculations intelligently or interpreting them correctly.

There are various ways to array the data concerning the costs of college instruction. Studies have focused on unit cost per credit hour,[9] cost per degree,[10] and cost per student.[11] Each of these measures has validity in certain specific contexts, but their use has been restricted because of the problems associated with developing comparability between independent or isolated studies. The warning expressed thirty-five years ago by the National Committee on Standard Reports for Institutions of Higher Education[12] is still appropriate today:

> It should be recognized that unit costs determined in different institutions are comparable only when they have been computed according to identical procedures. It may not be too much to say that they are comparable only when the computations in the different institutions have been made by the same individual, especially if the institutions compared vary widely in size, scope, location, and organization.. Costs computed for a small liberal-arts college, in which the instruction of students is practically the only function of the institution, should not be compared indiscriminately with those computed for a university in which the instruction of students is supplemented to a great extent by such functions as research, extension, and other service activities.

---

[9] A. E. Joyal, The Costs of Higher Education in 1960-1975 (Sacramento, California: Committee on the Regents of the University of California and the State Board of Education, 1960).

[10] Irene H. Butter, Economics of Graduate Education: An Exploratory Study (Washington, D.C.: United States Office of Education, 1966).

[11] William G. Bowen, "Economic Pressures on the Major Private Universities," in The Economics and Financing of Higher Education in the United States. A compendium of papers submitted to the Joint Economic Committee (Washington, D.C.: Congress of the United States, USGPT, 1969).

[12] Financial Reports for Colleges and Universities, compiled by the National Committee on Standard Reports for Institutions of Higher Education (University of Chicago Press, February 1935, p. 177).

The development of a standard determination of unit costs will aid higher education in evaluating the relative efficiency of operation by providing a benchmark for comparison with other institutions. However, the comparison of institutional cost data will be incomplete without output measures to relate comparability and relative quality to cost. Educators must guard against improper use of cost data; particularly comparisons between institutions that are not comparable in terms of mission, scope of operation, quality of instruction, etc. As Millett[13] has wisely cautioned:

> No part of cost analysis is fraught with more pitfalls for the unwary analyst of educational expenditures than the comparison of cost data among different institutions. The tendency to make such comparisons is, of course, strong. In the search for reasons to be satisfied or dissatisfied with any given situation, we ordinarily turn to others supposedly in like circumstances for comparison. Whether it be salary levels, teaching load, course offerings, or instructional facilities, institutions of higher education are constantly comparing their own situation with that of others.
>
> Yet such comparisons are often dangerous, or at least misleading, because they so frequently conceal more than they reveal. This is especially true of cost data. We have concluded that comparisons of the cost experiences of educational institutions must be used with the greatest possible degree of qualification.

Nonetheless, unit cost analysis can be of significant value to the management of educational institutions because of the manner in which such data can provide helpful insights to the costs of operation. However, care must be exercised in both the application and interpretation of unit cost data. Such data is merely a short-hand representation of cost and if it is not interpreted cautiously, may lead to faulty analysis.

---

[13] John D. Millett, Financing Higher Education in the United States, Columbia University Press, New York, 1952.

Williams[14] reported some general conclusions from his study of instructional cost which are appropriate to note in the application of unit cost analysis to higher education:

a. Instructional costs increase with the advance in the class level of the student.

b. Instructional costs must be analyzed for each college or university in relation to the number of students it enrolls in lower division, upper division, and graduate-professional programs.

c. Larger universities may have lower instructional costs than smaller institutions on a unit-cost basis, such as the semester credit hour.

d. There are wide variations from the average cost at each level within the schools and colleges of one university.

e. There are also wide variations in the costs within the departments of one degree-granting unit within a university.

f. Not only do universities, schools and colleges, departments, and even courses vary; there is no standardization of students, teachers, or volume of work required to produce one teaching or credit hour.

g. High costs in a given instructional area are not sufficient cause alone to abandon the educational program.

An application of this paper may be to describe one means of deriving unit costs in a manner which should help to clarify the various notions regarding the costs of higher education instruction and to substantiate, or perhaps refute, much of the folklore usually associated with such information. Meaningful management analysis in higher education will be furthered by the establishment of cost data comparability through the development of standard procedures for reporting the unit costs of instruction.

---

[14] Robert L. Williams, "The Cost of Educating One College Student," The Educational Record, American Council on Education, Washington, D.C., October, 1961.

A stated objective[15] of the WICHE Planning and Management Systems program is to establish comparability in this area through the development of standard procedures for reporting the costs of instruction by:

a. Academic discipline and course level of instruction.

b. Field of study (degree major) and level of student.

c. Type of degree and field of study.

"Academic discipline" refers to the instructional activities within a particular discipline, e.g., physics courses. These may be further distinguished by the target level of instruction; thus, "course level" refers to the level of sophistication at which instruction in a discipline may be offered,[16] e.g., lower division physics. The student's "field of study" refers to the mix of courses which typically may be credited toward a specific academic degree or certificate. Instruction by "student level" is based on the total accredited work by a student and reflects his level of progress toward a degree,[17] e.g., a sophomore physics major.

Often the cost concept is clouded in its application to academic instructional programs because of the dual nature of the instruction-producing activities. For example, all course offerings in physics comprise the physics discipline instruction program; whereas physics majors may take some courses in physics, some in mathematics, etc., to constitute a degree program in physics. Thus, the cost of a discipline instruction program may be reviewed in terms of the program's contribution to a degree in a field of study or in terms of the contribution within the discipline. Nevertheless, the distinction between a discipline instruction program cost and a degree program cost is fundamental and must be kept clear and explicit:

---

[15] Management Information Systems Program, Phase II: Objectives and Time Schedule of the WICHE Management Information Systems Program (Boulder, Colorado: Western Interstate Commission for Higher Education, May, 1969).

[16] Charles R. Thomas, Data Element Dictionary: Course, 1st ed. (Boulder, Colorado: Western Interstate Commission for Higher Education, February,1970).

[17] Charles R. Thomas, Data Element Dictionary: Students, 1st ed. (Boulder, Colorado: Western Interstate Commission for Higher Education, February, 1970).

a. The discipline instruction program is concerned with the instruction activities in a specific field of knowledge, i.e., discipline as defined by the HEGIS Taxonomy.[18]

b. The degree program is concerned with the instruction activities in which a student engages in the pursuit of a degree or certificate, i.e., the curricula mixes which lead to the award of a specific degree.

The Program Classification Structure immediately accommodates costs of discipline instruction by course level if instruction program elements are defined as course offerings by level, e.g., lower division physics instruction. With such data, reports of the form illustrated in Figure 1 may be a direct outcome of processing instruction program elements using the format of the Program Classification Structure.

Figure 1 is an example of a discipline instruction cost matrix using arbitrary data to represent relative expenditures by discipline category and course level. Such costs would be direct instruction expenditures, i.e., obtained directly from identified instruction

---

[18] The standard disciplines to be used in the Higher Education General Information Survey (HEGIS) will be published shortly by the National Center for Educational Statistics under the title, "A Taxonomy of Instructional Programs in Higher Education."

Total Direct Instruction Expenditures

(For a Given Term)

COURSE LEVEL

DISCIPLINE CATEGORY	Lower Division	Upper Division	Grad/Upper Division	Graduate Only	Other	Total
Agriculture and Natural Resources	81,000	102,000	203,000	302,000	61,000	749,000
Architecture and Environmental Design	---	92,500	143,500	162,500	31,500	430,000
Area Studies	78,000	56,000	48,000	93,000	22,000	297,000
Biological Sciences	143,000	212,000	69,000	344,000	86,000	854,000
⋮	(OTHER DISCIPLINES)					⋮
TOTAL	2,100,000	3,200,000	1,300,000	2,200,000	600,000	9,400,000

Source: Arbitrary data for illustrative purposes only.

Figure 1. EXAMPLE OF A DISCIPLINE INSTRUCTION EXPENDITURE MATRIX, $D = \{d_{ij}\}$

program elements. In addition to cost information, activity indicators such as student credit hours and weekly student contact hours will be included as part of the characteristic data associated with these program elements. Figure 2 is an example of a matrix which arrays total student credit hours by discipline category and course level. With such data, the discipline instruction cost matrix illustrated in Figure 1 may be converted to a unit cost matrix by dividing each element of the cost matrix by the total number of units associated with the element, say student credit hours, as in the matrix used in Figure 2. An example of a unit cost matrix is shown in Figure 3, which is computed by dividing each element in Figure 1 by the corresponding element in Figure 2.

To make the transition from unit costs by discipline instruction and course level to unit costs by field of study and student level, requires information on the distribution of courses taken by students of various levels in the different majors, e.g., the courses taken by freshmen majoring in Agriculture. Figure 4 is an example of a credit distribution matrix which describes the total number of credit hours generated by students majoring in Agriculture at a particular point in time.

Dividing the elements of each column in Figure 4 by the total number of students for the column results in an average distribution of credit hours per student by level. For example, suppose there were 20 freshmen majoring in Agriculture and they generated the credit hours shown in Column 1 of the Credit Distribution Matrix. Dividing each of the Column 1 entries by 20 will result in the distribution of average credit hours per freshman Agriculture major. This distribution of average credits is often referred to as the "induced course-load matrix"--a matrix which describes the distribution of the average load

Total Student Credit Hours

(For a Given Term)

COURSE LEVEL

DISCIPLINE CATEGORY	Lower Division	Upper Division	Grad/Upper Division	Graduate Only	Other	Total
Agriculture and Natural Resources	7,714	7,969	11,033	11,144	3,631	41,391
Architecture and Environmental Design	---	5,286	5,436	5,175	1,376	17,273
Area Studies	3,545	2,074	7,472	2,447	1,549	11,087
Biological Sciences	8,667	6,424	1,917	8,037	3,660	28,705
. . .	(OTHER DISCIPLINES)					. . .
TOTAL	152,174	137,931	41,270	59,545	27,778	418,698

Source: Arbitrary data for illustrative purposes only.

Figure 2. EXAMPLE OF A DISCIPLINE INSTRUCTION STUDENT CREDIT HOUR MATRIX, $U = \{u_{ij}\}$

Cost per Student Credit Hour

(For a Given Term)

COURSE LEVEL

DISCIPLINE CATEGORY	Lower Division	Upper Division	Grad/Upper Division	Graduate Only	Other	Average
Agriculture Natural Resources	10.50	12.80	18.40	27.10	16.80	18.09
Architecture and Environmental Design	---	17.50	26.40	31.40	22.90	24.89
Area Studies	22.00	27.00	32.60	38.00	14.20	26.79
Biological Sciences	16.50	33.00	36.00	42.80	23.50	29.75
. . .	(OTHER DISCIPLINES)					. . .
AVERAGE	13.80	23.20	31.50	36.70	21.60	22.45

Source: Based on Figures 1 and 2: Total Expenditures/Total Student Credit Hours, $c_{ij} = d_{ij}/u_{ij}$

Figure 3. EXAMPLE OF A DISCIPLINE INSTRUCTION UNIT COST MATRIX, $C = \{c_{ij}\}$

Field of Study: AGRICULTURE AND NATURAL RESOURCES
(Credit Hours for a Given Term)

	STUDENT LEVEL								
DISCIPLINE by COURSE LEVEL	1	2	3	4	5	6		12	TOTAL
(No. of Students)	(20)	(20)	(40)	(30)	(50)	(50)	. . .		(250)
Agriculture and Natural Resources									
Lower Division	120	140	80	20	10	10			400
Upper Division	20	40	60	90	70	40			350
Upper/Graduate	---	---	130	50	90	100			450
Graduate Only	---	---	---	10	30	50			180
Other	---	---	---	5	---	10			20
Subtotal	140	180	270	175	200	210	. . .		1,400
Architecture and Environmental Design									
Lower Division	---	10	15	---	---	---			30
Upper Division	---	---	5	10	20	30			100
Upper/Graduate	---	---	---	10	30	20			120
. . .	(O T H E R D I S C I P L I N E S)								. . .
TOTAL	330	340	600	390	400	300	. . .		3,000

Source: Arbitrary data for illustrative purposes only.

Figure 4. EXAMPLE OF A CREDIT DISTRIBUTION MATRIX, $V = \{v_{ijks}\}$

placed on the instruction program by students pursuing various degrees, e.g., the math courses taken by physics majors, chemistry courses taken by history majors, upper division courses taken by freshmen.

It should be noted that there is some question as to the stability of the induced course-load matrix over time; i.e., does the matrix change radically from year to year? A recent study has indicated that the induced course-load matrix may be sufficiently dynamic to distort analysis which is based on the assumption of stability.[19] The extent and nature of the problem will vary from campus to campus, and thus, should be investigated by each institution.

Figure 5 is an example of a portion of an induced course-load matrix for a given term and a particular field of study. The portion of the induced course-load matrix illustrated in Figure 5 is a three-dimensional matrix which describes the historical or current average distribution of credit hours for a student in Agriculture and Natural Resources by student level for each discipline and course level at a particular point in time. The elements of Figure 5 are derived from the Credit Distribution Matrix by dividing each column entry (i.e., total credit hours generated in a given discipline and course level by a class of students, say freshmen, in a given field of study) by the number of students in the column. Thus, an element of the induced course-load matrix shown in Figure 5 represents the number of credits

---

[19] Frank I. Jewett, Alan P. Feddersen, Donald F. Lawson, and William D. O'Grady, The Feasibility of Analytic Models for Academic Planning: A Preliminary Analysis of Seven Quarters of Observations of the "Induced Course-Load Matrix," The California State Colleges, Division of Information Systems, September, 1970.

Field of Study: AGRICULTURE AND NATURAL RESOURCES
(Average Credit Hours per Student for a Given Term)

STUDENT LEVEL

DISCIPLINE by COURSE LEVEL	1	2	3	4	5	6	. . . 12	OVERALL AVERAGE
Agriculture and Natural Resources								
Lower Division	6.0	7.0	2.0	0.7	0.2	0.2		1.6
Upper Division	1.0	2.0	1.5	3.0	1.4	0.8		1.4
Upper/Graduate	---	---	3.2	1.7	1.8	2.0		1.8
Graduate Only	---	---	---	0.2	0.6	1.0		0.7
Other	---	---	---	0.1	---	0.2		0.1
Subtotal	7.0	9.0	6.7	5.7	4.0	4.2	. . .	5.6
Architecture and Environmental Design								
Lower Division	---	0.5	0.4	---	---	---		0.1
Upper Division	---	---	0.1	0.3	0.4	0.6		0.4
Upper/Graduate	---	---	---	0.3	0.6	0.4		0.5
. . .	(O T H E R D I S C I P L I N E S)							. . .
TOTAL	16.5	17.0	15.0	13.0	8.0	6.0	. . .	12.0

Source: Based on Figure 4: Credit Hours/No. of Students

Figure 5. EXAMPLE OF AN INDUCED COURSE-LOAD MATRIX, $\bar{V} = \{\bar{v}_{ijks}\}$

that a typical Agriculture student at some level, say Column 1 - freshman, will take in the various disciplines and course levels, e.g., 6.0 credits in lower-division agriculture. The column totals indicate the average course load by student level, e.g., Column 2 - 17.0 credits for the typical sophomore. Note that the complete induced course-load matrix is normally four-dimensional: field of study by student level and discipline by course level.

In the sections following, an explicit methodology is proposed for computing the unit costs of instruction and the cost per degree-winner. The costing approach is straightforward--total direct expenditure divided by number of units is equal to unit cost. Direct expenditures are considered to be those costs attributable to instruction program elements as defined by the Program Classification Structure. The cost per degree-winner is computed by pricing the students' historical work (e.g., credits taken) at the institution using the unit cost; i.e., the units taken times the cost of those units. The cost per degree-winner has three components: direct instructional cost, allocated instruction support cost, and the indirect student support cost.

Although the algebra used in sections following may be tedious for many to follow, it is extremely helpful for mathematically-oriented readers in understanding the proposed methodology. The non-algebraic reader is encouraged to proceed through the next two sections, bypassing the formulae, but not the text. Each algebraic expression is described in the text in an effort to aid the reader in following the discussion and understanding the proposed methodology.

SECTION II

Algebra of Unit Costs

The proposed methods of deriving unit costs of instruction and the cost per degree-winner are sufficiently complex to require an algebraic description. For the purposes of describing the relationships between the various cost components, the following notation has been adopted:

For discipline i, course level j, let:

d_{ij} = direct instruction cost (based on instruction program elements), (1)

u_{ij} = number of units (e.g., student credit hours), (2)

c_{ij} = cost per unit of direct instruction, which is direct instruction cost divided by the number of units (3)

$= d_{ij}/u_{ij}$

For field of study k, and level of student s, let:

n_{ks} = number of students (head count), (4)

v_{ijks} = total number of units in discipline i, course level j, generated by students in field k of level s (i.e., an element of the credit distribution matrix). (5)

Note that v_{ijks} summed over all fields of study and student levels is equal to u_{ij}, the number of units in discipline i, course level j:

$$u_{ij} = \sum_{k}\sum_{s} v_{ijks} \qquad (6)$$

Thus, for a given time period, Figure 1 is an example of the discipline instruction cost matrix $D = \{d_{ij}\}$, Figure 2 is an example of the discipline instruction credit matrix $U = \{u_{ij}\}$, Figure 3 is an example of the discipline instruction unit cost matrix $C = \{c_{ij}\}$, and Figure 4 is an example of a portion of the credit distribution matrix $V = \{v_{ijks}\}$ for a given field of study k. Figure 5, the Induced Course-Load Matrix, is derived from the matrix V by dividing each v_{ijks} by the appropriate number of students, n_{ks}.

It has not yet been determined whether student credit hours, weekly student contact hours, or some other dimension of instruction, should be used as the unit measure for discipline instruction costs. Studies in the area of higher education simulation models[20] indicate that weekly student contact hours tend to reflect more accurately the load placed upon the institutional resources and should be used to determine the extent of resource utilization. However, it is not always possible to relate contact hours to non-classroom forms of individual instruction, e.g., the use of special learning devices and independent study. Moreover, for the purpose of determining cost of degrees, credit hours should most likely be used, since credit hours are typically the unit basis for the award of degrees and various innovative instructional techniques are usually equated to credit hours. The examples following use student credit hours, although for the purposes of certain types of analysis weekly student contact hours should be substituted; e.g., facilities utilization, staff effort, and similar studies in which contact time is an important factor. Moreover, it should be noted that the algebraic formulations are such that any appropriate unit measure may be used, including such units as course or section, contact hours, blocks, or other measures of progress through the system. Further, it should be noted that the units of measure used for cost analysis are not necessarily the same units that may be used as the basis for cost allocation. Such allocation procedures may use a variety of indices such as assignable square feet, number of personnel, expenditures, etc.

---

[20] e.g., George Weathersby, "Development and Applications of a University Cost Simulation Model," An unpublished monograph (University of California, Berkeley: Office of Analytical Studies, June 15, 1967). And Richard W. Judy, "Systems Analysis for Efficient Resource Allocation in Higher Education," in Minter and Lawrence, eds., Management Information Systems: Their Development and Use in the Administration of Higher Education (Boulder, Colorado: Western Interstate Commission for Higher Education, October 1969). And H. E. Koenig, M. G. Keeney, and R. Zemach, Systems Analysis and Planning in University Administration (East Lansing: Michigan State University, Division of Engineering Research, 1967).

It may be well to point out that the algebra is dealing with historical average costs rather than marginal costs. For most applications, the unit cost data indicates what the operational expenses were when spread across the student body. This does not imply that the cost of admitting, say, one additional student (i.e., the marginal cost) is equal to the average unit cost, since instruction cost tends to vary in a stepped fashion. For example, the marginal cost of admitting an additional student to a course may be zero for all practical purposes if additional institutional resources are not required. However, the marginal cost may be far above the average cost if the admittance of an additional student required adding a new section. On the other hand, if the average cost is computed in terms of units which reflect the actual commitment of institutional resources, say the average unit cost per section, then the average cost is often approximately the same as the marginal cost, depending of course, on the circumstances.

For a given time period,[21] the following costs may be determined:

a. The unit cost of direct instruction in discipline i at course level j is direct instruction cost, d_{ij}, divided by the number of units, u_{ij}:

$$c_{ij} = d_{ij}/u_{ij} \tag{7}$$

b. The average cost per unit for direct instruction in discipline i is the direct cost d_{ij}, summed over all course levels, divided by the number of units, u_{ij}, summed over all course levels:

$$\bar{c}_{i.} = \sum_j d_{ij}/\sum_j u_{ij} \tag{8}$$

which is equivalent to summing the unit cost, c_{ij}, over each course level, weighted by the number of units in each course level, u_{ij}, and dividing by the sum of the units (sum of the weights):

$$\bar{c}_{i.} = (\sum_j c_{ij}u_{ij})/\sum_j u_{ij} \tag{9}$$

---

[21] Each variable may be dimensioned by the time interval over which the values are generated.

c. Similarly, the average cost per unit for direct instruction at course level j is the sum of the direct cost, d_{ij}, for each discipline, divided by the sum of the units for each discipline:

$$\bar{c}_{.j} = \sum_i d_{ij} / \sum_i u_{ij} \tag{10}$$

$$= (\sum_i c_{ij} u_{ij}) / \sum_i u_{ij} \tag{11}$$

d. The total direct instruction cost, T_D, is the direct instruction cost by discipline and course level, d_{ij}, summed over all disciplines and course levels:

$$T_D = \sum_{ij}\sum d_{ij} \tag{12}$$

e. The direct cost of instruction for field of study k and student level s may be derived from the unit cost by discipline and course level, c_{ij}, times the number of units in discipline i, course level j generated by students in field of study k at student level s, v_{ijks}, summed over all disciplines and course levels:

$$d^*_{ks} = \sum_{ij}\sum c_{ij} v_{ijks} \tag{13}$$

Note that d^*_{ks} summed over all fields of study and student levels is total direct instruction cost, T_D:

$$T_D = \sum_{ks}\sum d^*_{ks} = \sum_{ij}\sum d_{ij} \tag{14}$$

f. The average cost of instruction per student (headcount) for students in field of study k at student level s is the direct cost, d^*_{ks}, divided by the number of students, n_{ks}:

$$m_{ks} = d^*_{ks}/n_{ks} \tag{15}$$

g. The average cost of instruction per student (headcount) for all students in field of study k is determined from the direct cost, d^*_{ks}, summed over all student levels and divided by the number of students, n_{ks}, summed over all student levels:

$$\bar{m}_{k.} = \sum_s d^*_{ks}/\sum_s n_{ks} \tag{16}$$

Note that $\bar{m}_{k.}$ may be computed from the average cost per student in field of study k at student level s, m_{ks}, weighted by the number of students in field k at level s, summed over all student levels and divided by the total number of students in field of study k:

$$\bar{m}_{k.} = (\sum_s m_{ks}n_{ks})/\sum_s n_{ks} \tag{17}$$

h. Similarly, the average cost of instruction per student (headcount) by student level is:

$$\bar{m}_{.s} = \sum_k d^*_{ks}/\sum_k n_{ks} \tag{18}$$

$$= (\sum_k m_{ks}n_{ks})/\sum_k n_{ks} \tag{19}$$

Observe that cost per student by field and level, m_{ks}, may be derived on an FTE (full-time equivalent) basis by defining the number of students, n_{ks}, in terms of FTE rather than headcount. Let:

ε = Standard number of units per full-time equivalent student[22] (e.g., 15 credits). (20)

n^*_{ks} = Number of FTE students in field of study k at level s. (21)

FTE enrollment may be derived from the number of units generated by students in field of study k at level s by summing v_{ijks} over all disciplines and course levels and dividing by ε, the standard number of units per FTE student.

$$n^*_{ks} = \sum_{i}\sum_{j} v_{ijks}/\varepsilon \quad (22)$$

i. The average cost of instruction per FTE student for students in field of study k at student level s is computed in the same manner as (15) where FTE enrollment, n^*_{ks}, replaces headcount enrollment, n_{ks}:

$$m^*_{ks} = d^*_{ks}/n^*_{ks} \quad (23)$$

By substituting from (13) for d^*_{ks} and from (22) for n^*_{ks}, the average cost of instruction per FTE student may be written as:

$$m^*_{ks} = \varepsilon \sum_{i}\sum_{j} c_{ij}\, v_{ijks}/\sum_{i}\sum_{j} v_{ijks} \quad (24)$$

---

[22] Note that ε may be subscripted by field of study or student level (or both) without any loss in generality.

which may be summarized to cost per FTE student by student level and cost per FTE student by field of study in the same manner as in (16) through (19).

j. The average cost of instruction for an FTE student in field of study k is computed precisely the same as in (16) and (17); substituting the number of FTE students in field of study k at student level s, n^*_{ks}, for the headcount variable, n_{ks}:

$$\bar{m}^*_{k.} = \sum_s d^*_{ks} / \sum_s n^*_{ks} \tag{25}$$

$$= (\sum_s m^*_{ks}\ n^*_{ks}) / \sum_s n^*_{ks} \tag{26}$$

k. Similarly, the average cost of instruction for an FTE student at student level s is computed by substituting the number of FTE students, n^*_{ks}, for the number of headcount students, n_{ks}, in (18) and (19):

$$\bar{m}^*_{.s} = \sum_k d^*_{ks} / \sum_k n^*_{ks} \tag{27}$$

$$= (\sum_k m^*_{ks}\ n^*_{ks}) / \sum_k n^*_{ks} \tag{28}$$

Observe that it is necessary to draw a careful distinction between cost per headcount student, m_{ks}, and cost per FTE student, m^*_{ks}. The headcount unit cost variable m_{ks} reflects both the typical load and mix of courses associated with students in field of study k at level s. The FTE unit cost variable, m^*_{ks}, reflects only cost differences resulting from the mix of courses. Thus, m_{ks} has implications with regard to marginal cost analysis in terms of degree programs, i.e., it may be used to approximate the marginal cost to a degree program of admitting an additional student in field of study k.

SECTION III

Theoretical Degree Cost for One Student

The proposed methodology for determining the cost per degree-winner is based on the assumption that such costs are a function of the instructional activities which comprise the degree curriculum for a completing student. On this basis, costs are defined in terms of the historical pattern of institutional resources utilized by the student in completing the degree. Thus, such costs will vary as a function of student preferences and degree requirements. It is therefore important to observe that given a methodology, there are basically three forms of degree-winner costs associated with the institutional expenditures for instruction:

a. The normative cost, i.e., the institutional cost that would be incurred if students pursued a typical curriculum over the normal time frame, say 132 semester credit hours over four years.

b. The actual average cost, i.e., the average cost incurred from the curricula mix which actually resulted in the degree, say 145 semester credit hours over five years.

c. The minimum cost, i.e., the cost if students pursued an optimum course of study, selecting minimum cost courses, taking a larger load, and completing with the minimum requirements in the shortest possible time.

For any institution concerned with resource allocation, information on all three forms of degree-winner costs will be helpful for evaluating the relative cost efficiency of its operation. In addition, information on the costs associated with students who do not complete (intermediate output) and on the proportion of degree-winners to the number of students pursuing a degree, will be necessary for such analysis. The material that follows deals only with the actual average cost, although the algebra adapts easily to computing the other two costs.

In costing methodology, it is common to describe costs in terms of direct and indirect expenditures. Direct cost generally refers to those costs which are identified with a product or service, whereas, indirect costs are those costs which are not immediately identified with a specific product or service.[23] For the purposes of this paper, direct instructional cost was defined to be the cost of operating instructional program elements as described by the Program Classification Structure. Indirect instructional cost would, therefore, be those support costs associated with operating the instruction program. Although support cost consists of both fixed and variable costs, consider such indirect costs as variable costs which are a function of the instructional program elements and therefore attributable to instruction activities.

---

[23] Paul B. Fertig, Donald F. Istvan, and Homer J. Motfice, Using Accounting Information - An Introduction, Harcourt, Brace & World, Inc. New York, 1965, p. 115.

There exists another set of variable support costs which are incurred as a result of operating an instruction program, but may be considered independent of the instructional activities of the institution. Such costs are those associated with providing various support services to students of the institution and are normally incurred in a manner which is independent of a student's course enrollments, but rather, typically result as function of the student being present in the system; e.g., the Student Health Service, Counseling, Student Records, etc. Although such student support costs consist of both direct and indirect cost, for purposes of this level of analysis consider such cost as indirect student support.

Therefore, the cost per degree-winner, G, may be considered as consisting of three types of costs:

a. The direct instructional cost incurred in generating the degree, I_D.
b. The allocated support costs associated with the direct instructional costs, I_A, and
c. Indirect student support costs generated by virtue of the degree-winner being present in the system, I_F.

I_D and I_A are computed as a function of the course enrollments which comprise the degree, whereas, I_F is a cost incurred each time a student is present in the system and is independent of the course enrollments. The costs which comprise I_A and I_F are disjoint; the former based on the portion of support cost allocated to instruction program elements, the latter based on support costs attributable to non-instructional student support.

$$G = I_D + I_A + I_F \tag{29}$$

To illustrate the computation of the unit cost per degree-winner, consider first the case of one student completing a degree in the field of study k. Adopting the previous notation, define a new variable, t, to represent the time period or academic year/term.[24] For this student, let $t = 1$ be the time period in which the student first entered the system and $t = p$ be the time period in which the degree was awarded. For clarity, adopt the convention that variables which are a function of time will be represented as $q(t)$; e.g., $c_{ij}(t)$ is the cost per unit of direct instruction in discipline i at course level j, during time t.

For the given student, let:

$e_{ij}(t)$ = number of credit hours in discipline i, course level j, during time t. (30)

For the purposes of computational convenience, define an indicator variable, z, such that $z(t) = 1$ if the student enrolled in one or more courses during time t; and $z(t) = 0$ if the student was not enrolled during time t:

$$z(t) = \begin{cases} 1 & \text{if } \Sigma\Sigma e_{ij}(t) > 0 \\ 0 & \text{otherwise} \end{cases} \qquad (31)$$

Define as additional system variables:

$a_{ij}(t)$ = support cost per credit hour of instruction allocated to discipline i, course level j, in time t. (32)

---

[24] Note that t represents a time frame which may be defined in terms of quarters, semesters, academic year, calendar year, fiscal year, etc.

$f_{ks}(t)$ = indirect cost per student by field of study k and student level s in time t, independent of course enrollments. (33)

The variable $a_{ij}(t)$ is derived from the total support costs allocated to instruction in discipline i at course level j, divided by the total number of student credit hours, $u_{ij}(t)$. The variable $f_{ks}(t)$ is based on the portion of student services and other support costs attributable to students in field of study k at level s, divided by the number of such students, $n_{ks}(t)$. Because of the operational difficulties associated with determining $f_{ks}(t)$, and the likelihood of relatively small variance across k and s, it is recommended that an average be used for determining the indirect student costs.

Let $\bar{f}(t)$ be an average indirect cost per student over all fields of study and student levels.

$$\bar{f}(t) = \left[\sum_{k}\sum_{s} f_{ks}(t) \cdot n_{ks}(t) \right] / \sum_{k}\sum_{s} n_{ks}(t) \qquad (34)$$

An alternative formulation of $\bar{f}(t)$ is to form a sum of the total cost attributable to student support activities, including those costs such as student records and perhaps some portions of academic support which are determined to be student related but independent of course enrollments. Let $T_S(t)$ be the sum of such student support-related costs. Then, $\bar{f}(t)$ may be computed simply as the total cost of student support divided by the total enrollment.[25]

$$\bar{f}(t) = T_S(t) / \sum_{k}\sum_{s} n_{ks}(t) \qquad (35)$$

---

[25] The variable $\bar{f}(t)$ may be averaged over relevant student levels appropriate to the degree; e.g., for post-baccalaureate degree cost, restrict $\bar{f}(t)$ to post-baccalaureate student levels. Each institution should determine the relative significance of error that may be introduced by using an overall average.

The indirect cost attributable to the degree-winner for time period t is the indicator variable, $z(t)$, times the average indirect cost per student, $\bar{f}(t)$:

$$I_F(t) = z(t) \cdot \bar{f}(t) \tag{36}$$

The direct cost of instruction for each term is computed by summing across all disciplines and course levels the product of course enrollments for each discipline i and course level j, $e_{ij}(t)$, times the respective direct unit cost, $c_{ij}(t)$:

$$I_D(t) = \sum_{ij}\sum e_{ij}(t) \cdot c_{ij}(t) \tag{37}$$

The allocated instruction cost is computed in the same manner as the direct cost by summing across all disciplines and course levels the product of course enrollments for each discipline i and course level j, $c_{ij}(t)$, times the respective allocated unit cost, $a_{ij}(t)$:

$$I_A(t) = \sum_{ij}\sum e_{ij}(t) \cdot a_{ij}(t) \tag{38}$$

Observe that the functional form of $I_D(t)$ and $I_A(t)$ appears to be relatively straightforward in (37) and (38). However, the actual function may be very complex when the formulation of c_{ij} and a_{ij} are substituted; particularly (38) because of the many components of cost which enter into a_{ij} in various ways depending on the allocation procedures used in deriving the allocated instruction cost. Further, while the cost components of direct instruction and allocated instruction are disjoint, there is a degree of interdependence between the activities which generate direct costs and the associated activities which provide the support. Note also that $I_D(t)$ and $I_A(t)$ may be combined in a single equation by adding (37) to (38) and factoring $e_{ij}(t)$; i.e.,

$$I_{DA}(t) = \sum_{ij}\sum \left(e_{ij}(t) \cdot [c_{ij}(t) + a_{ij}(t)] \right) \tag{39}$$

However, it is desirable to keep the two types of costs separate for analysis and comparison purposes, particularly for exchanging cost information with other institutions.

For this given student, completing a degree of type g in field k (e.g., a B.A. in History) over the time interval t = 1 to t = p, the cost of the degree is:

$$G_{kg} = \sum_{t=1}^{p} \left[I_D(t) + I_A(t) + I_F(t) \right] \tag{40}$$

$$= I_D + I_A + I_F \tag{41}$$

SECTION IV

The Extension to n Students: Cost per Degree-Winner

The extension of the previous degree cost formulae to compute the degree costs for more than one student (i.e., for n students) is straightforward given the Program Classification Structure or some equivalent means to capture historical data on direct instruction cost by discipline and course level, the $c_{ij}(t)$; Cost Finding Principles or some means of attributing support costs to instruction and students, the $a_{ij}(t)$ and $\bar{f}(t)$; and machine-readable transcripts or sampling procedures to record the course credits, $e_{ij}(t)$.

Suppose for time period t = p there are n students who received a degree in field of study k of type g,[26] denote these as:

$n_{kg}(p)$ = number of students receiving a degree (i.e., degree-winners) in field of study k of type g (e.g., a History B.A.) at time t = p (42)

The $e_{ij}(t)$ defined previously in (30) must now be subscripted to represent each of the $n_{kg}(p)$ degree-winners. Let $e_{ij}(t)_b$ represent the number of credit hours in discipline i at course level j taken in term t, by the b^{th} student in the set of $n_{kg}(p)$ degree winners, $b = 1, 2, \ldots, n_{kg}(p)$. In most cases, $e_{ij}(t)_b$ will be different for each b. Using the previous notation, let $e^*_{ij}(t)$ denote the total number of credit hours generated in discipline i, course level j, by the set of $n_{kg}(p)$ degree winners.

---

[26] Observe that this is opposite of the common form of analysis based on entering cohorts and tracking forward in time, i.e., the proposed approach is based on the students in a graduating cohort tracked backwards in time to their point of entry into the system.

$$e^*_{ij}(t) = \sum_b e_{ij}(t)_b \tag{43}$$

$$b = 1, 2, \ldots, n_{kg}(p)$$

$$t = p, p-1, p-2, \ldots, 2, 1$$

Where $1 \leq t \leq p$ is a reasonable range of time periods to capture the major portion of costs attributable to the n_{kg} degree-winners. The range of t may vary with each institution, if not with k and g, and should be determined through an analysis of student flows. It would appear that six to eight years will be adequate for most purposes, depending in part on the availability and reliability of data, the value of $n_{kg}(p)$, the nature of enrollment and persistence patterns, etc. Of course, a very long range could be used to capture every dollar attributable to each degree-winner, but for large $n_{kg}(p)$, the resulting difference in average cost will most likely be negligible.[27]

For each period t, the components of instruction are computed as before. Substituting $e^*_{ij}(t)$ for $e_{ij}(t)$ in (37), the direct instruction cost for students completing the degree type g in field of study k is the product of course credits and direct cost per credit summed over all disciplines and course levels:

---

[27] Note that capturing an additional 10% cost for 10% of the graduating students changes the total degree cost by only 1% and is virtually negligible in the unit cost per degree, but may modify the variance in formula (53).

$$I_{D,kg}(t) = \sum_{i}\sum_{j} e^*_{ij}(t) \cdot c_{ij}(t) \tag{44}$$

Similarly, the allocated instruction cost is the product of course credits and allocated cost per credit summed over all disciplines and course levels:

$$I_{A,kg}(t) = \sum_{i}\sum_{j} e^*_{ij}(t) \cdot a_{ij}(t) \tag{45}$$

and the indirect student cost is the number of graduating students enrolled times the indirect cost per student:

$$I_{F,kg}(t) = z^*(t) \cdot \bar{f}(t) \tag{46}$$

Where $z^*(t)$ is the sum of the indicator variable $z(t)$ defined in (21), subscripted for each of the $n_{kg}(p)$ students:

$$z^*(t) = \sum_{b} z_b(t) \tag{47}$$

$$b = 1, 2, \ldots, n_{kg}(p)$$

$$z_b(t) = \begin{cases} 1 \text{ if } \sum_{i}\sum_{j} e_{ij}(t)_b > 0 \\ 0 \text{ otherwise} \end{cases} \tag{48}$$

The cumulative cost to the institution for degree-winners in field of study k, of type g, completing at t = p is the sum of the three costs over time

$$G_{kg}(p) = \sum_{t=1}^{p} \left[I_{D,kg}(t) + I_{A,kg}(t) + I_{F,kg}(t) \right] \tag{49}$$

Hence, the mean unit cost per degree-winner is the total cost divided by the number of students awarded degrees

$$\bar{Y}_{kg}(p) = G_{kg}(p)/n_{kg}(p) \tag{50}$$

An alternative formulation is to compute the degree cost for each degree-winner and sum over all students in the graduating set

$$G_{kg}(p)_b = \sum_{t=1}^{p} \left(I_D(t)_b + I_A(t)_b + I_F(t)_b \right) \qquad (51)$$

$$\bar{\gamma}_{kg}(p) = \frac{\sum_{b=1}^{n_{kg}(p)} G_{kg}(p)_b}{n_{kg}(p)} \qquad (52)$$

Where $I_D(t)_b$, $I_A(t)_b$, and $I_F(t)_b$ are computed for each student in the set, b=1, 2, ... , $n_{kg}(p)$, as in formulae (36), (37), and (38). The average cost per degree-winner will be the same as in (50); however, (51) and (52) permit the calculation of the variance of the unit costs for the graduating set.

$$\sigma^2_{kg}(p) = \frac{\sum_{b=1}^{n_{kg}(p)} [G_{kg}(p)_b - \bar{\gamma}(p)]^2}{n_{kg}(p)} \qquad (53)$$

Notice that with the exception $f_{ks}(t)$ defined in (33), the derivation of cost per degree-winner does not require information which identifies the student's prior declared field of study and previously attained student levels. By using an average cost for computing $I_F(t)$; i.e., $\bar{f}(t)$, historical costs may be derived without information on changes in the field of study (major switching) and level of student. Nonetheless, such information will be useful for internal analysis since the cost per degree-winner may vary significantly if extensive changes of major occur, e.g., a change in major typically requires additional credits and thereby increases the cost.

The proposed approach to determining cost per degree-winner is based on the notion that prior work taken by transfer students does not cost the institution, i.e., the only cost to any single institution is the costs associated with instruction offered by that institution. Thus, the cost per degree-winner for an institution may be significantly reduced by large numbers of students transferring into the institution. This does not assume that previous costs have not been incurred by students transferring into an institution. On the contrary, the cost per degree-winner has been derived in a manner which permits the calculation of such costs in a compatible fashion in order that they may be incorporated into the degree-winner cost for multi-institutional cost analysis.

Similarly, attrition is not included in the cost per degree-winner since it is considered as intermediate output which may be input to another institution. There has been some discussion over the issue of whether the cost per degree-winner should include the cost of attrition. Clearly, if an institution annually carries, say 100 students, in a particular degree program but graduates only three or four, it is reasonable to wonder what happened to the cost for the balance of the students. In general, there are three alternatives:

a. Some of the students are still in the degree program.
b. Some of the students have switched to other degree programs.
c. Some of the students have left the system.

In the first case, the unit cost formulae will reflect an extended period of time to complete the degree and will therefore provide an accurate portrayal of the degree-winner costs. In the second case, the cost for the students who have switched majors will be reflected in the other programs, usually at a substantial increase because of the excess credits normally associated with degree switching. In the third case, the cost attributable to those students who left the system will be reflected as intermediate output cost. By holding these costs separable, the unit cost formulation gains the very desirable property of being additive for multi-institution computations. Considering dropouts as intermediate output assumes that there is some positive benefit associated with the student having been in the higher education system. To do otherwise would assume that instruction to "non-degree-winners" is totally wasted, and must be written off as a loss. This appears inconsistent with most views of higher education.

In an effort to clarify terminology, it is proposed that the term "cost per degree-winner" be restricted to those applications which do not include the cost of students who fail to complete the degree program, i.e., cost per degree-winner excludes the costs of attrition. The term "cost per degree" should be reserved for those applications in which the costs attributable to non-degree-winners are included with the costs of the degree-winners, i.e., cost per degree includes the cost of attrition.

Observe that the proposed formulation permits the determination of the unit cost for intermediate output; i.e., dropouts and/or transfers, in a manner that is compatible with degree-winner output cost, and therefore, permits adding the two to compute total cost. Suppose that n' students in field of study k at level s, leave the system in time period t = p. Denote these as

$$n'_{ks}(p) = \text{number of students in field of study } k \text{ at level } s\text{, that leave at time } t = p \qquad (54)$$

The cumulative cost to the institution for intermediate output in field k at level s, L_{ks}, is derived in the same manner as degree-winner output by summing the three cost components over the appropriate time frame.

$$L_{ks}(p) = \sum_{t=1}^{p} \left(I_{D,ks}(t) + I_{A,ks}(t) + I_{F,ks}(t) \right) \quad (55)$$

The mean unit cost is the cumulative cost divided by the number of students that left the system

$$\bar{\lambda}_{ks}(p) = L_{ks}(p)/n'_{ks}(p) \quad (55)$$

Formulating the cost of intermediate output in a manner that is compatible with degree-winner output cost permits total cost to be computed for system-wide analysis; i.e., the cost of transfer students within a state system can be added to compute total state cost. Further, it permits the intermediate output cost to be added to the cost per degree-winner in order to determine total cost per degree.

Any form of cost analysis requires extensive data to protray accurately the state of the system. When dealing with unit cost it is particularly important to retain as much information as possible in order to avoid false conclusions from misleading statistics. No single unit cost statistic is sufficient to describe the state of the system; thus, proper analysis requires not only an array of various unit costs but also the number of units. Figure 6 is an example of the type of report which may be produced using this algebra for a given discipline.[28] It is likely that institutions will wish to expand the data categories shown in Figure 6 to include such items as cost per course, average class size, salary data, mean time to completion of degree, number of transfers, proportion of dropouts, mean time to withdrawal, etc.

---

[28] For an alternative approach to such data array, see Paul W. Hamelman "A Decision Framework for Colleges and Universities" in the Pittsburgh Business Review, No. 7, Vol. 40, University of Pittsburgh, Bureau of Business Research, July 1970.

Annual Unit Costs

Discipline: PSYCHOLOGY

	1965-66		1966-67		1967-68	
	No. of Units	Unit Cost	No. of Units	Unit Cost	No. of Units	Unit Cost
1. Cost per Credit Hour	20,506	$ 33.13	21,738	$ 36.61	22,689	$ 41.22
a. Direct Instruction		$ 15.89		$ 17.89		$ 21.33
Lower Division	13,08[illegible]	5.46	13,710	5.46	13,744	5.75
Upper Division	6,10[illegible]	17.15	6,279	17.88	7,107	21.84
Graduate	1,316	116.56	1,749	115.36	1,838	135.85
b. Allocated Instruction		$ 17.24		$ 18.72		$ 19.98
Lower Division		$ 15.66		$ 16.30		$ 16.50
Upper Division		21.73		24.15		23.82
Graduate		67.57		67.56		77.29
2. Direct Instruction Cost Per Student Major by Level						
Freshman	19	$ 301.12	21	$ 328.25	23	$ 358.43
Sophomores	21	333.27	23	349.48	26	389.67
Juniors	43	452.18	41	468.83	48	512.19
Seniors	41	431.86	46	452.21	45	487.51
Undergraduate	124	$ 387.23	131	$ 401.12	142	$ 438.92
Masters	48	1049.04	56	1038.24	63	1222.65
Doctoral	18	815.92	22	807.52	21	950.95
Graduate	66	$ 987.23	78	$ 956.14	84	$1083.42
Total/Average	190	$ 514.17	209	$ 587.23	226	$ 656.89
3. Average Intermediate Output	64	$1267.00	70	$1342.00	80	$1421.00
a. Lower Division Students	24	$ 828.00	26	$ 877.00	29	$ 929.00
Direct		340.00		360.00		381.00
Allocated		334.00		354.00		375.00
Indirect		154.00		163.00		173.00
b. Upper Division Students	18	$1658.00	20	$1756.00	24	$1859.00
Direct		$ 682.00		$ 722.00		$ 765.00
Allocated		667.00		706.00		748.00
Indirect		309.00		328.00		346.00
c. Graduate Students	22	$1184.00	24	$1254.00	27	$1328.00
Direct		$ 586.00		$ 621.00		$ 657.00
Allocated		435.00		461.00		488.00
Indirect		163.00		172.00		183.00
4. Cost Per Degree-Winner						
a. B.A.	36	$3584.00	42	$3795.00	40	$4019.00
Direct		$1453.00		$1538.00		$1629.00
Indirect		1729.00		1831.00		1939.00
Allocated		402.00		426.00		451.00
b. M.A.	16	$2648.00	18	$2804.00	20	$2970.00
Direct		$1252.00		$1326.00		$1404.00
Indirect		1186.00		1256.00		1330.00
Allocated		210.00		222.00		236.00
c. Ph.D.	4	$6461.00	5	$6842.00	6	$7246.00
Direct		$3055.00		$3235.00		$3426.00
Indirect		2894.00		3065.00		3245.00
Allocated		512.00		542.00		575.00

Figure 6. EXAMPLE OF A UNIT COST ANALYSIS REPORT

Source: Arbitrary data for illustrative purposes only (based in part on the empirical study)

SECTION V

An Empirical Study

For those cases where complete data is not available or cannot be easily obtained, sampling techniques may be used to determine estimated values of the $e^*_{ij}(t)$'s and the cost factors, $c_{ij}(t)$, $a_{ij}(t)$, and $\bar{f}(t)$, to calculate the cost per degree-winner. In order to demonstrate the application of sampling techniques for the determination of cost per degree-winner and to illustrate the applications of the degree-winner cost formulae, an empirical study was undertaken using data from a major western public university. A random sample of twenty students was drawn from the set of June 1969 bachelor of arts graduates in psychology.[29] The credit distribution matrix for the sample is shown in Figure 7. The sample consisted of eight transfer students (40%) which is fairly consistent with the high proportion of transfer students in the population of this particular university.

The direct instructional cost used for this sample study is based on the instructional salary costs per student credit hour published in the "Historical Summary" prepared by the Office of Institutional Research of the university. The table of direct instructional cost, $c_{ij}(t)$, is shown in Figure 8.

---

[29] A total of 120 students graduated in June 1969 with a B.A. in psychology.

TOTAL CREDIT FOR SAMPLE (N=2[illegible]) OF 1969 PSYCHOLOGY GRADUATES

DISCIPLINE	....1963-64....			....1964-65....			....1965-66....			....1966-67....			....1967-68....			....1968-69....			TOTAL	ALL	YEARS
	LOWR DIV.	UPPR DIV.	TOTAL	LOWR DIV.	UPPR DIV.	TOTAL	LOWR DIV.	UPPR DIV.	TOTAL	LOWR DIV.	UPPR DIV.	TOTAL	LOWR DIV.	UPPR DIV.	TOTAL	LOWR DIV.	UPPR DIV.	TOTAL	LOWER DIVSN	UPPER DIVSN	GRAND TOTAL
ANTHROPOLOGY	0	0	0	8	0	8	0	0	0	0	0	0	0	3	3	6	3	9	14	6	20
ART	0	0	0	1	0	1	2	0	2	4	0	4	4	2	6	14	10	24	25	12	37
ASTROGEOPHYS	0	0	0	0	0	0	0	0	0	8	0	8	0	0	0	0	0	0	8	0	8
BIOLOGY	0	0	0	0	0	0	0	0	0	12	0	12	4	5	9	0	6	6	16	11	27
BOTANY	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	0	0	0	0	4	4
BUSINESS	0	0	0	0	0	0	6	0	6	3	3	6	0	0	0	0	2	2	9	5	14
CHEMISTRY	0	0	0	9	0	9	14	0	14	0	8	8	21	12	33	0	3	3	44	23	67
ECONOMICS	0	0	0	0	0	0	12	0	12	12	0	12	6	0	6	9	0	9	39	0	39
EDUCATION	0	0	0	0	0	0	0	0	0	6	0	6	0	2	2	6	0	6	12	2	14
ENGLISH	14	0	14	18	0	18	48	5	53	16	10	26	48	6	54	26	50	76	170	71	241
FRENCH	0	0	0	5	0	5	17	0	17	10	0	10	32	3	35	9	10	19	73	13	86
GEOLOGY	0	0	0	0	0	0	16	0	16	16	0	16	15	0	15	4	0	4	51	0	51
GERMAN	0	0	0	0	0	0	16	0	16	18	0	18	11	0	11	4	0	4	49	0	49
HISTORY	0	0	0	8	0	8	0	0	0	9	0	9	15	0	15	6	6	12	38	6	44
HONORS	0	0	0	0	0	0	0	0	0	3	0	3	0	10	10	0	25	25	3	35	38
HUMANITITES	0	0	0	0	0	0	0	0	0	10	0	10	0	0	0	0	0	0	10	0	10
ITALIAN	0	0	0	0	0	0	10	0	10	8	0	8	0	0	0	0	0	0	18	0	18
LATIN	0	0	0	0	0	0	0	0	0	10	0	10	6	0	6	0	0	0	16	0	16
MATHEMATICS	10	0	10	15	0	15	36	0	36	44	0	44	19	3	22	3	0	3	127	3	130
MUSIC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2	0	2
PHILOSOPHY	6	0	6	0	0	0	9	0	9	22	7	29	19	3	22	10	0	10	66	10	76
PHYSICAL ED.	3	0	3	4	0	4	13	0	13	3	0	3	2	0	2	4	0	4	29	0	29
PHYSICS	0	0	0	8	0	8	3	0	3	9	0	9	22	0	22	10	0	10	52	0	52
POLITICAL SC	3	0	3	0	0	0	9	0	9	6	0	6	6	0	6	3	0	3	27	0	27
PSYCHOLOGY	8	0	8	0	0	0	51	3	54	48	50	98	85	200	285	4	269	273	196	522	718
RUSSIAN	6	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	6
SOCIOLOGY	0	0	0	0	0	0	15	3	18	18	16	34	12	56	68	3	86	89	48	161	209
SPANISH	0	0	0	10	0	10	6	0	6	10	0	10	18	0	18	6	3	9	50	3	53
SPEECH	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	6	6	12	9	6	15
STATISTICS	0	0	0	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	3	0	3
ZOOLOGY	0	0	0	0	0	0	0	0	0	3	0	3	0	5	5	0	3	3	3	8	11
JOURNALISM	0	0	0	0	0	0	0	0	0	0	3	3	0	4	4	0	0	0	0	7	7
TOTAL	50	0	50	86	0	86	286	11	297	311	97	408	345	318	663	135	482	617	3632	1453	5085

Figure 7. CREDIT DISTRIBUTION MATRIX FOR EMPIRICAL STUDY, $e^*_{ij}(t)$

TABLE OF DIRECT INSTRUCTION COST (COST PER CREDIT HOUR)

DISCIPLINE	..1963-64.. LOWER DIVSN	UPPER DIVSN	..1964-65.. LOWER DIVSN	UPPER DIVSN	..1965-66.. LOWER DIVSN	UPPER DIVSN	..1966-67.. LOWER DIVSN	UPPER DIVSN	..1967-68.. LOWER DIVSN	UPPER DIVSN	..1968-69.. LOWER DIVSN	UPPER DIVSN
ANTHROPOLOGY	9.27	13.20	7.36	23.38	9.42	21.88	10.13	25.56	8.88	36.64	7.00	19.00
ART	12.85	26.89	12.33	31.14	15.87	27.06	12.05	28.15	14.49	30.20	16.00	25.00
ASTROGEOPHYS	39.63	45.24	20.23	35.42	15.68	89.18	11.87	85.96	14.45	94.70	25.00	92.00
BIOLOGY	13.43	19.02	14.58	18.70	10.78	24.22	10.02	35.84	11.23	32.12	11.00	25.00
BOTANY	13.43	19.02	14.58	18.70	10.78	24.22	10.02	35.84	11.23	32.12	11.00	25.00
BUSINESS	17.01	21.50	12.77	21.55	12.05	20.99	11.34	17.48	11.33	18.28	10.00	16.00
CHEMISTRY	9.17	22.17	8.02	27.32	8.21	30.89	10.84	36.39	13.90	40.03	11.00	28.00
ECONOMICS	91.17	18.42	13.85	67.68	17.39	68.80	23.68	77.43	21.72	80.69	8.00	16.00
EDUCATION	9.61	13.15	8.20	14.59	9.56	17.88	12.41	24.39	11.96	22.39	8.00	20.00
ENGLISH	11.28	11.50	10.13	13.67	10.06	14.07	10.91	12.35	10.93	14.85	12.00	17.00
FRENCH	9.75	32.92	9.06	21.28	9.00	24.04	10.21	28.45	10.08	24.78	11.00	27.00
GEOLOGY	11.92	51.33	10.22	56.84	9.17	56.49	11.65	60.99	11.13	58.90	12.00	59.00
GERMAN	10.72	43.73	11.61	33.87	11.09	38.00	10.83	28.15	12.25	46.18	12.00	48.00
HISTORY	4.84	7.86	5.55	8.14	6.40	9.98	6.23	11.08	6.97	10.39	8.00	14.00
HONORS	47.18	57.80	41.81	55.95	42.66	62.85	55.10	81.02	44.34	55.87	0.00	39.00
HUMANITITES	14.45	0.00	13.34	0.00	14.90	0.00	20.26	24.07	16.92	24.43	15.00	21.00
ITALIAN	-0.00	-0.00	-0.00	-0.00	11.60	62.53	15.19	99.97	18.32	83.93	16.00	75.00
LATIN	31.16	61.11	29.80	87.52	22.46	91.68	20.33	63.64	25.63	62.11	14.00	98.00
MATHEMATICS	17.94	19.84	13.01	14.68	12.90	21.17	10.02	27.10	11.33	30.12	12.00	42.00
MUSIC	35.09	51.58	38.07	50.67	36.04	46.55	42.81	60.06	43.09	44.50	48.00	36.00
PHILOSOPHY	11.78	20.14	11.85	23.42	11.72	29.19	13.40	26.53	12.22	21.99	14.00	20.00
PHYSICAL ED.	20.84	41.38	19.97	38.76	19.88	43.76	21.00	40.43	20.30	52.56	28.00	41.00
PHYSICS	17.27	46.93	20.28	49.05	21.11	54.26	16.33	91.69	17.53	78.48	17.00	59.00
POLITICAL SC	8.21	7.81	6.88	8.63	4.38	10.14	6.48	10.75	5.97	12.47	6.00	10.00
PSYCHOLOGY	5.66	19.41	4.97	18.75	5.17	17.15	5.46	17.88	5.75	21.84	7.00	22.00
RUSSIAN	22.33	64.12	27.16	74.43	30.98	77.92	26.41	79.80	22.69	81.99	15.00	66.00
SOCIOLOGY	6.04	7.49	5.21	9.97	4.77	12.91	4.61	11.74	6.01	13.43	5.00	11.00
SPANISH	-0.00	-0.00	-0.00	-0.00	9.59	19.95	9.87	20.29	10.95	18.55	10.00	27.00
SPEECH	19.11	28.81	21.04	25.79	23.19	28.82	21.72	32.44	23.08	30.82	21.00	32.00
STATISTICS	-0.00	-0.00	9.42	12.34	8.74	17.25	11.26	20.60	10.38	15.76	9.00	17.00
ZOOLOGY	13.43	19.02	14.58	18.70	10.78	24.22	10.02	35.84	11.23	32.12	11.00	25.00
JOURNALISM	21.42	52.22	32.17	54.91	25.61	44.00	29.56	41.78	23.36	35.70	27.00	30.00

Figure 8. TABLE OF $c_{ij}(t)$

The allocated instruction costs, $a_{ij}(t)$, was determined from published budgetary and expense figures for the university and derived in two parts, a constant portion and a variable portion. The constant portion of the allocated instruction cost consists of 40% of the annual library cost, 60% of the annual plant operations and maintenance costs, 60% of the annual administration and general expenditures attributable to program costs, and 7.5% of the total annual instructional expenditures to account for administrative expenses in this category. Excluded from the allocated instruction costs are central executive management expenditures which consist of approximately 3.8% of the administrative and general expense.[30] The constant portion of the $a_{ij}(t)$ which was attributed to each of the disciplines is:

t	Constant $ ([illegible])
1963-64	$7.72
1964-65	$7.79
1965-66	$8.12
1966-67	$8.59
1967-68	$9.08
1968-69	$8.67

The variable portion of the allocated instructional costs was developed from an analysis of the expenditures in the discipline to determine the portion of total discipline expenditures attributable to non-salary costs. This variable factor is defined in the following manner:

$$x_i(t) = \frac{\text{Total Discipline Expense}}{\text{Discipline Instructional Salary Expense}} - 1.0 \qquad (56)$$

---

[30] The percentages used to estimate the allocated costs are based on actual 1968-69 data. These proportions are assumed to be approximately the same for prior years.

This factor, $x_i(t)$, was applied to the direct cost of instruction by discipline by year, and added to the constant factor for the year to determine the total allocated instruction cost, i.e.:

$$a_{ij}(t) = x_i(t)c_{ij}(t) + \text{constant } \$(t) \qquad (57)$$

The resultant unit costs are shown in Figure 9.

Included in Figure 9 is a listing of the annual fixed cost per student or indirect student cost, $\bar{f}(t)$. The indirect student cost is based on the cost of student services, registration and admissions, a portion of the library expenditures (20%), and the total expenditures for student activities.

The computed estimate of degree cost by student is shown in summary form in Figure 10. The three components of cost per degree-winner: direct instruction, allocated instruction, and indirect student expenditures, are shown along with the total degree cost. For this sample of 20 students, the cost per degree awarded ranges from $2,180 for student 4 (a transfer student) to $6,119 for student 3. The mean cost per degree-winner for the sample is $4,019, of which approximately 40% resulted from direct instruction expenditures. Note, however, that the sample standard deviation is relatively high, S.D. = $1,100, because of the wide range in the cost per degree-winner.

Figure 11 is a detailed listing of the estimated degree cost per student showing, by year, the cost for each student in the sample by level of course including the direct, allocated, and indirect cost per student attributable for the given year. Also shown on Figure 11 is the average cost per student by level of instruction and type of cost over the six year time frame.

TABLE OF ALLOCATED INSTRUCTION COST (COST PER CREDIT HOUR)

DISCIPLINE	..1963-64.. LOWER DIVSN	UPPER DIVSN	..1964-65.. LOWER DIVSN	UPPER DIVSN	..1965-66.. LOWER DIVSN	UPPER DIVSN	..1966-67.. LOWER DIVSN	UPPER DIVSN	..1967-68.. LOWER DIVSN	UPPER DIVSN	..1968-69.. LOWER DIVSN	UPPER DIVSN
ANTHROPOLOGY	11.86	13.32	11.22	17.16	12.31	16.94	13.05	18.77	13.07	23.37	11.97	16.42
ART	15.01	23.24	14.82	24.46	16.96	22.70	15.47	23.73	17.21	25.27	17.58	22.19
ASTROGEOPHYS	25.82	28.28	17.37	24.04	15.70	47.97	14.50	47.03	16.12	51.35	20.34	32.20
BIOLOGY	18.81	23.14	19.77	22.96	17.16	27.57	17.05	37.03	18.47	34.64	17.88	28.72
BOTANY	18.81	23.14	19.77	22.96	17.16	27.57	17.05	37.03	18.47	34.64	17.88	28.72
BUSINESS	12.19	12.83	11.66	12.91	11.88	13.16	12.25	13.13	12.74	13.73	12.14	13.00
CHEMISTRY	17.27	27.92	16.40	32.21	16.88	35.46	19.51	40.43	22.50	43.90	19.72	33.64
ECONOMICS	30.18	13.89	12.93	24.99	14.06	25.57	15.93	27.97	15.99	29.19	12.50	14.29
EDUCATION	11.80	12.40	11.64	12.71	12.20	13.59	13.14	15.14	13.56	15.30	12.49	14.49
ENGLISH	10.97	10.98	10.96	11.20	11.28	11.56	11.81	11.91	12.30	12.57	11.97	12.31
FRENCH	10.78	12.18	10.81	11.55	11.14	12.04	11.68	12.78	12.16	13.05	11.81	12.77
GEOLOGY	15.98	35.10	15.23	37.84	15.05	38.00	16.72	40.65	16.96	40.13	16.97	39.76
GERMAN	11.08	13.79	11.22	13.05	11.51	13.72	11.96	13.38	12.56	15.35	12.13	15.09
HISTORY	11.11	11.74	11.36	11.87	11.85	12.56	12.29	13.24	12.93	13.60	12.72	13.89
HONORS	57.05	67.60	51.79	65.83	52.96	73.01	65.78	91.52	55.59	67.04	11.15	49.88
HUMANITITES	16.12	10.20	15.74	10.27	16.71	10.60	19.38	20.94	18.50	21.58	17.30	19.76
ITALIAN	10.20	10.20	10.27	10.27	11.62	16.10	12.41	19.87	13.17	18.95	12.56	17.75
LATIN	14.06	17.78	13.97	21.12	13.39	21.97	13.59	18.96	14.74	19.26	12.89	22.06
MATHEMATICS	17.90	18.71	15.85	16.57	16.13	19.68	15.37	22.70	16.42	24.48	16.30	29.17
MUSIC	19.50	22.96	20.29	22.94	20.10	22.31	21.99	25.61	22.54	22.83	23.16	20.64
PHILOSOPHY	12.45	12.67	12.62	12.93	12.85	13.32	13.36	13.72	13.82	14.08	13.46	13.62
PHYSICAL ED.	21.36	30.46	21.15	29.47	21.34	31.92	22.30	30.91	22.48	36.77	25.48	31.24
PHYSICS	21.09	36.49	22.83	37.76	23.49	40.69	21.48	60.59	22.59	54.22	21.90	43.70
POLITICAL SC	13.33	13.27	13.30	13.56	13.17	14.01	13.95	14.57	14.36	15.31	13.96	14.54
PSYCHOLOGY	14.89	21.60	14.73	21.45	15.05	20.90	15.66	21.73	16.30	24.15	16.50	23.82
RUSSIAN	13.65	16.49	14.15	17.36	14.64	17.83	14.80	18.43	15.03	19.07	14.10	17.57
SOCIOLOGY	13.24	13.50	13.25	14.12	13.40	14.89	13.84	15.15	14.59	15.95	13.99	15.09
SPANISH	12.13	12.13	12.30	12.30	13.45	14.45	13.95	14.95	14.54	15.27	14.04	15.67
SPEECH	15.80	17.66	16.34	17.25	16.98	18.06	17.17	19.23	17.92	19.41	17.11	19.22
STATISTICS	9.76	9.76	11.18	11.59	11.41	12.63	12.24	13.58	12.60	13.37	12.00	13.14
ZOOLOGY	20.15	24.48	21.11	24.30	18.50	28.91	18.39	38.37	19.81	35.98	19.22	30.06
JOURNALISM	21.08	29.05	23.93	29.82	22.56	27.33	24.06	27.22	22.94	26.14	23.47	24.25

FIXED COST PER STUDENT

1963-64	1964-65	1965-66	1966-67	1967-68	1968-69
118.11	129.13	127.98	117.36	137.21	111.97

Figure 9. TABLE OF $a_{ij}(t)$ and $\bar{f}(t)$

SUMMARY OF ESTIMATED DEGREE COST BY STUDENT

(SAMPLE OF TWENTY 1969 GRADUATES AWARDED B.A. IN PSYCHOLOGY)

SAMPLE ELEMENT (STUDENT)	DIRECT INSTRUCTION EXPENDITURES	ALLOCATED INSTRUCTION EXPENDITURES	INDIRECT STUDENT EXPENDITURES	TOTAL DEGREE COST
1.	1696	1843	367	3905
2.	1504	1701	367	3572
3.	2587	3047	485	6119
4.	883	1048	249	2180
5.	1078	1315	249	2642
6.	1076	1355	249	2681
7.	1383	1536	249	3168
8.	921	1186	367	2473
9.	1634	2038	367	4039
10.	1654	2094	495	4242
11.	1852	2336	495	4682
12.	1443	1464	495	3401
13.	1187	1346	613	3145
14.	1629	1961	495	4084
15.	1788	2102	495	4384
16.	1739	2016	742	4497
17.	2274	2795	624	5693
18.	1702	2251	624	4577
19.	2353	2924	495	5772
20.	2198	2427	495	5119
TOTAL	32580	38785	9011	80376
AVERAGE	1629.00	1939.25	450.54	4018.79
SAMPLE STD. DEV.	461.169	565.136	137.136	1100.025

Figure 10. SUMMARY OF ESTIMATED DEGREE COST BY STUDENT

ESTIMATED DEGREE COST BY STUDENT (SAMPLE OF 1969 GRADUATES WITH B.A. DEGREE IN PSYCHOLOGY)

SAMPLE ELEMENT (STUDENT)	.....1963 -64.....			.....1964 -65.....			.....1965 -66.....			.....1966 -67.....			.....1967 -68.....			.....1968 -69.....			TOTAL ALL YEARS
	DIRECT	ALLO-CATED	TOTAL	DIRECT	ALLO-CATED	TOTAL	DIRECT	ALLO-CATED	TOTAL	DIRECT	ALLO-CATED	TOTAL	DIRECT	ALLO-CATED	TOTAL	DIRECT	ALLO-CATED	TOTAL	
1. LOWER	0	0	0	0	0	0	0	0	0	351	420	771	219	162	382	134	159	293	1445
UPPER	0	0	0	0	0	0	0	0	0	0	0	0	497	545	1033	504	556	1060	2094
INDIRECT		0	0		0	0		0	0		117	117		137	137		112	112	367
SUBTOTAL	0	0	0	0	0	0	0	0	0	351	537	888	706	846	1552	638	827	1465	3905
2. LOWER	0	0	0	0	0	0	0	0	0	331	454	785	250	419	669	0	0	0	1454
UPPER	0	0	0	0	0	0	0	0	0	0	0	0	272	239	511	651	590	1241	1751
INDIRECT		0	0		0	0		0	0		117	117		137	137		112	112	367
SUBTOTAL	0	0	0	0	0	0	0	0	0	331	572	902	522	794	1317	651	701	1352	3572
3. LOWER	457	478	934	0	0	0	0	0	0	548	615	1163	243	379	622	12	16	28	2747
UPPER	0	0	0	0	0	0	0	0	0	0	0	0	520	608	1127	808	951	1759	2887
INDIRECT		118	118		0	0		0	0		117	117		137	137		112	112	485
SUBTOTAL	457	596	1052	0	0	0	0	0	0	548	732	1280	763	1124	1887	820	1080	1900	6119
4. LOWER	0	0	0	0	0	0	0	0	0	0	0	0	163	253	417	52	63	115	532
UPPER	0	0	0	0	0	0	0	0	0	0	0	0	[illegible]	145	276	537	586	1123	1399
INDIRECT		0	0		0	0		0	0		0	0		137	137		112	112	249
SUBTOTAL	0	0	0	0	0	0	0	0	0	0	0	0	294	535	830	589	761	1350	2180
5. LOWER	0	0	0	0	0	0	0	0	0	0	0	0	240	374	614	78	116	194	808
UPPER	0	0	0	0	0	0	0	0	0	0	0	0	287	291	578	473	534	1007	1585
INDIRECT		0	0		0	0		0	0		0	0		137	137		112	112	249
SUBTOTAL	0	0	0	0	0	0	0	0	0	0	0	0	527	802	1329	551	762	1313	2642
6. LOWER	0	0	0	0	0	0	0	0	0	0	0	0	268	449	717	99	87	186	904
UPPER	0	0	0	0	0	0	0	0	0	0	0	0	225	257	482	484	562	1046	1528
INDIRECT		0	0		0	0		0	0		0	0		137	137		112	112	249
SUBTOTAL	0	0	0	0	0	0	0	0	0	0	0	0	493	843	1336	583	761	1344	2681
7. LOWER	0	0	0	0	0	0	0	0	0	0	0	0	336	531	867	80	88	168	1035
UPPER	0	0	0	0	0	0	0	0	0	0	0	0	322	340	663	644	577	1221	1884
INDIRECT		0	0		0	0		0	0		0	0		137	137		112	112	249
SUBTOTAL	0	0	0	0	0	0	0	0	0	0	0	0	659	1009	1667	724	777	1501	3168
8. LOWER	0	0	0	0	0	0	0	0	0	0	0	0	355	531	886	94	137	231	1117
UPPER	0	0	0	0	0	0	0	0	0	54	65	119	0	0	0	418	453	871	989
INDIRECT		0	0		0	0		0	0		117	117		137	137		112	112	367
SUBTOTAL	0	0	0	0	0	0	0	0	0	54	183	236	355	668	1023	512	701	1213	2473

Figure 11. DETAIL ESTIMATED COST BY STUDENT

ESTIMATED DEGREE COST BY STUDENT (SAMPLE OF 1969 GRADUATES WITH B.A. DEGREE IN PSYCHOLOGY)

SAMPLE ELEMENT (STUDENT)	.....1963 -64.....			.....1964 -65.....			.....1965 -66.....			.....1966 -67.....			.....1967 -68.....			.....1968 -69.....			TOTAL ALL YEARS
	DIRECT	ALLO-CATED	TOTAL	DIRECT	ALLO-CATED	TOTAL	DIRECT	ALLO-CATED	TOTAL	DIRECT	ALLO-CATED	TOTAL	DIRECT	ALLO-CATED	TOTAL	DIRECT	ALLO-CATED	TOTAL	
9. LOWER	0	0	0	0	0	0	0	0	0	104	184	287	155	209	364	118	134	252	903
UPPER	0	0	0	0	0	0	0	0	0	252	321	583	422	474	895	575	716	1291	2769
INDIRECT		0	0		0	0		0	0		117	117		137	137		112	112	367
SUBTOTAL	0	0	0	0	0	0	0	0	0	355	622	988	576	821	1397	693	962	1655	4039
10. LOWER	0	0	0	0	0	0	438	511	949	290	442	721	233	357	590	57	73	130	2390
UPPER	0	0	0	0	0	0	0	0	0	54	65	119	218	241	459	374	405	779	1358
INDIRECT		0	0		0	0		128	128		117	117		137	137		112	112	495
SUBTOTAL	0	0	0	0	0	0	438	639	1077	333	624	957	452	736	1188	431	590	1021	4242
11. LOWER	0	0	0	0	0	0	301	475	776	318	390	708	84	118	201	60	91	151	1837
UPPER	0	0	0	0	0	0	0	0	0	72	87	158	636	724	1360	381	451	832	2351
INDIRECT		0	0		0	0		128	128		117	117		137	137		112	112	495
SUBTOTAL	0	0	0	0	0	0	301	603	904	389	594	984	720	979	1698	441	655	1096	4682
12. LOWER	0	0	0	0	0	0	154	279	433	108	113	221	135	138	273	48	49	97	1024
UPPER	0	0	0	0	0	0	0	0	0	231	137	368	473	463	936	294	295	579	1883
INDIRECT		0	0		0	0		128	128		117	117		137	137		112	112	495
SUBTOTAL	0	0	0	0	0	0	154	407	561	339	367	706	608	739	1347	342	445	787	3401
13. LOWER	21	21	42	0	0	0	60	68	128	22	63	84	55	85	140	63	51	114	509
UPPER	0	0	0	0	0	0	0	0	0	0	0	0	516	555	1071	450	502	952	2024
INDIRECT		118	118		0	0		128	128		117	117		137	137		112	112	613
SUBTOTAL	21	139	160	0	0	0	60	196	256	22	180	202	571	777	1348	513	666	1179	3145
14. LOWER	0	0	0	0	0	0	303	386	689	358	405	763	135	252	387	60	84	144	1983
UPPER	0	0	0	0	0	0	0	0	0	0	0	0	197	217	414	577	615	1192	1606
INDIRECT		0	0		0	0		128	128		117	117		137	137		112	112	495
SUBTOTAL	0	0	0	0	0	0	303	514	817	358	523	980	331	607	936	637	811	1448	4084
15. LOWER	0	0	0	0	0	0	298	483	782	125	162	287	56	102	158	150	103	253	1480
UPPER	0	0	0	0	0	0	0	0	0	268	324	592	406	447	853	485	481	966	2410
INDIRECT		0	0		0	0		128	128		117	117		137	137		112	112	495
SUBTOTAL	0	0	0	0	0	0	298	611	910	393	604	997	461	686	1148	635	696	1331	4384
16. LOWER	197	213	410	320	365	684	138	231	369	84	113	197	23	65	88	96	114	210	1959
UPPER	0	0	0	0	0	0	109	102	212	289	286	576	131	145	276	352	381	733	1796
INDIRECT		118	118		129	129		128	128		117	117		137	137		112	112	742
SUBTOTAL	197	331	528	320	494	814	247	462	709	373	517	890	154	347	501	448	607	1055	4497

Figure 11. DETAIL ESTIMATED COST BY STUDENT (continued)

ESTIMATED DEGREE COST BY STUDENT (SAMPLE OF 1969 GRADUATES WITH B.A. DEGREE IN PSYCHOLOGY)

SAMPLE ELEMENT (STUDENT)	.....1963 -64.....			.....1964 -65.....			.....1965 -66.....			.....1966 -67.....			.....1967 -68.....			.....1968 -69.....			TOTAL ALL YEARS
	DIRECT	ALLO-CATED	TOTAL	DIRECT	ALLO-CATED	TOTAL	DIRECT	ALLO-CATED	TOTAL	DIRECT	ALLO-CATED	TOTAL	DIRECT	ALLO-CATED	TOTAL	DIRECT	ALLO-CATED	TOTAL	
17. LOWER	0	0	0	295	442	737	288	384	671	151	238	400	160	235	396	170	219	389	2,592
UPPER	0	0	0	0	0	0	0	0	0	215	227	442	513	672	1286	372	377	749	2,276
INDIRECT		0	0		129	129		128	128		117	117		137	137		112	112	624
SUBTOTAL	0	0	0	295	571	866	288	512	799	376	583	959	773	1045	1818	542	708	1250	5,693
18. LOWER	0	0	0	238	416	654	213	362	575	290	370	660	98	111	209	183	224	407	2,505
UPPER	0	0	0	0	0	0	51	63	114	125	152	277	349	385	736	154	167	321	1,448
INDIRECT		0	0		129	129		128	128		117	117		137	137		112	112	624
SUBTOTAL	0	0	0	238	545	783	265	553	818	415	640	1055	448	634	1082	337	502	839	4,577
19. LOWER	0	0	0	0	0	0	305	426	731	218	347	564	368	554	922	152	159	311	2,529
UPPER	0	0	0	0	0	0	0	0	0	291	323	615	560	613	1178	459	497	956	2,148
INDIRECT		0	0		0	0		128	128		117	117		137	137		112	112	795
SUBTOTAL	0	0	0	0	0	0	305	554	859	509	738	1296	928	1309	2237	611	769	1380	5,772
20. LOWER	0	0	0	0	0	0	355	423	778	291	450	751	23	65	88	36	36	72	1,089
UPPER	0	0	0	0	0	0	0	0	0	0	0	0	521	529	1050	972	914	1886	2,936
INDIRECT		0	0		0	0		128	128		117	117		137	137		112	112	495
SUBTOTAL	0	0	0	0	0	0	355	551	905	291	578	869	544	731	1275	1008	1062	2070	5,119
SAMPLE MEAN N =			(3)			(3)			(11)			(16)			(20)			(20)	
LOWER	225	237	462	234	407	692	259	366	625	224	299	523	180	270	450	87	100	187	1,572
UPPER	0	0	0	0	0	0	15	15	30	116	124	241	364	395	759	498	530	1028	1,996
INDIRECT		118	118		129	129		128	128		117	117		137	137		112	112	751
GRAND TOTAL	225	355	580	234	537	821	274	509	783	340	540	881	544	802	1346	585	742	1327	4,019

Figure 11. DETAIL ESTIMATED COST BY STUDENT (continued)

SECTION VI

Estimating Future Costs

For the purpose of estimating future costs, it may be necessary to develop a complex stochastic system to predict $v_{ijks}(t)$ and thus determine $u_{ij}(t)$ for distributing the estimated costs. Although it is assumed that cost exchange procedures will be concerned with only historical cost, a means to estimate future unit costs will be incorporated in the WICHE Resource Requirements Prediction Model to aid in planning and program analysis.

In its present form, the first version of the Resource Requirements Prediction Model, RRPM-1, requires the user to specify both the enrollments, $n_{ks}(t)$, and the induced course-load matrix for each year of the forecast time frame. With this data, the $v_{ijks}(t)$ may be determined for each term and the $u_{ij}(t)$ derived from $v_{ijks}(t)$. The model will produce all of the data required to estimate $d_{ij}(t)$ and compute the various unit costs previously described in the section on the Algebra of Unit Costs, including a set of algorithms to derive $a_{ij}(t)$.

In order to estimate the cost per degree-winner, it is necessary to describe the distribution of a graduating set over time for each degree type and field of study specified. This matrix is referred to as the Degree Profile Matrix, $\bar{E} = \{\bar{e}_{ij}(t)\}$, a matrix describing the distribution of credits by discipline and course level for the typical degree-winner. Figure 12 is an example of a Degree Profile Matrix for a B.A. in

DEGREE PROFILE MATRIX -- PSYCHOLOGY B.A. (1969 SAMPLE, N = 20)

	.1963-64.		.1964-65.		.1965-66.		.1966-67.		.1967-68.		.1968-69.	
	LOWR DIV.	UPPR DIV.	LOWR DIV.	UPPR DIV.	LOWR DIV.	UPPR DIV.	LOWR DIV.	UPPR DIV.	LOWR DIV.	UPPR DIV.	LOWR DIV.	UPPR DIV.
DISCIPLINE												
ANTHROPOLOGY	0.0	0.0	.4	0.0	0.0	0.0	0.0	0.0	0.0	.1	.3	.1
ART	0.0	0.0	.1	0.0	.1	0.0	.2	0.0	.2	.1	.7	.5
ASTROGEOPHYS	0.0	0.0	0.0	0.0	0.0	0.0	.4	0.0	0.0	0.0	0.0	0.0
BIOLOGY	0.0	0.0	0.0	0.0	0.0	0.0	.6	0.0	.2	.3	0.0	.3
BOTANY	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.2	0.0	0.0
BUSINESS	0.0	0.0	0.0	0.0	.3	0.0	.1	.1	0.0	0.0	0.0	.1
CHEMISTRY	0.0	0.0	.4	0.0	.7	0.0	0.0	.4	1.0	.6	0.0	.1
ECONOMICS	0.0	0.0	0.0	0.0	.6	0.0	.6	0.0	.3	0.0	.4	0.0
EDUCATION	0.0	0.0	0.0	0.0	0.0	0.0	.3	0.0	0.0	.1	.3	0.0
ENGLISH	.7	0.0	.9	0.0	2.4	.3	.8	.5	2.4	.3	1.3	2.5
FRENCH	0.0	0.0	.3	0.0	.8	0.0	.5	0.0	1.6	.1	.4	.5
GEOLOGY	0.0	0.0	0.0	0.0	.8	0.0	.8	0.0	.8	0.0	.2	0.0
GERMAN	0.0	0.0	0.0	0.0	.8	0.0	.9	0.0	.5	0.0	.2	0.0
HISTORY	0.0	0.0	.4	0.0	0.0	0.0	.4	0.0	.8	0.0	.3	.3
HONORS	0.0	0.0	0.0	0.0	0.0	0.0	.1	0.0	0.0	.5	0.0	1.3
HUMANITITES	0.0	0.0	0.0	0.0	0.0	0.0	.5	0.0	0.0	0.0	0.0	0.0
ITALIAN	0.0	0.0	0.0	0.0	.5	0.0	.4	0.0	0.0	0.0	0.0	0.0
LATIN	0.0	0.0	0.0	0.0	0.0	0.0	.5	0.0	.3	0.0	0.0	0.0
MATHEMATICS	.5	0.0	.8	0.0	1.8	0.0	2.2	0.0	.9	.1	.1	0.0
MUSIC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.1	0.0
PHILOSOPHY	.3	0.0	0.0	0.0	.4	0.0	1.1	.3	.9	.1	.5	0.0
PHYSICAL ED.	.1	0.0	.2	0.0	.6	0.0	.1	0.0	.1	0.0	.2	0.0
PHYSICS	0.0	0.0	.4	0.0	.1	0.0	.4	0.0	1.1	0.0	.5	0.0
POLITICAL SC	.1	0.0	0.0	0.0	.4	0.0	.3	0.0	.3	0.0	.1	0.0
PSYCHOLOGY	.4	0.0	0.0	0.0	2.5	.1	2.4	2.5	4.3	10.0	.2	13.4
RUSSIAN	.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SOCIOLOGY	0.0	0.0	0.0	0.0	.8	.1	.9	.8	.6	2.8	.1	4.3
SPANISH	0.0	0.0	.5	0.0	.3	0.0	.5	0.0	.9	0.0	.3	.1
SPEECH	0.0	0.0	0.0	0.0	0.0	0.0	.1	0.0	0.0	0.0	.3	.3
STATISTICS	0.0	0.0	0.0	0.0	.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ZOOLOGY	0.0	0.0	0.0	0.0	0.0	0.0	.1	0.0	0.0	.3	0.0	.1
JOURNALISM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	.1	0.0	.2	0.0	0.0
SUBTOTAL	2.5	0.0	4.3	0.0	14.3	.5	15.5	4.8	17.2	15.9	6.7	24.1
CUMULATIVE TOTAL		2.5		6.8		21.6		42.0		75.2		106.0

Figure 12. EXAMPLE OF A DEGREE PROFILE MATRIX, $\bar{e}_{ij}(t)$

Psychology based on the sample data used in the empirical study. Using the sample data, each element of the matrix, $\bar{e}_{ij}(t)$, is computed as an average of credits which comprise a typical degree; viz., the total number of credits in discipline i, course level j, generated at time t, by the $n_{kg}(p)$ graduating students (i.e., $e^*_{ij}(t)$) divided by the sample size, $n_{kg}(p)$

$$\bar{e}_{ij}(t) = e^*_{ij}(t)/n_{kg}(p) \tag{57}$$

A set of algorithms will estimate the $a_{ij}(t)$ based on costs produced by the model; thus, estimates of direct and allocated instruction cost, $I'_D(t)$ and $I'_A(t)$, may be computed from the model data.

In order to estimate $I_F(t)$, it is necessary to input a Distribution Vector, $\bar{D}_{p'} = \{\bar{d}(1), \bar{d}(2) \ldots \bar{d}(p')\}$ where p' is the future year of the graduating set, which reflects the average enrollment distribution over time for a graduating set. Each element of the vector $\bar{D}_{p'}$ may be computed from historical sample data by dividing the number of students in the sample graduating set that are present in the system at time t, $z^*(t)$, by the total number in the set, $n_{kg}(p)$

$$\bar{d}(t) = z^*(t)/n_{kg}(p) \tag{58}$$

$$0 \leq \bar{d}(t) \leq 1.0$$

$$t = 1, 2, \ldots p-1, p$$

For example, $\bar{D}_{p'}$ based on the data used in the empirical study of 1969 B.A.'s in psychology is a vector with six elements which are estimates of the proportion of a graduating set present in a given year.

$$\bar{D}_{1969} = (0.10, 0.15, 0.55, 0.60, 1.0. 1.0)$$

If we assume that this distribution is representative of future enrollment patterns; i.e., transfer policy and student persistence remain constant, then $I'_F(t)$ for future periods may be estimated using predicted values of the indirect cost per student, $\bar{f}(t)$.

The cost per degree-winner is computed in the same fashion as formula (40)

$$\bar{Y}' = \sum_{t=1}^{p'} [I'_D(t) + I'_A(t) + I'_F(t)] \qquad (59)$$

This particular approach to the problem of estimating future degree-winner costs assumes that most institutions will be interested in only selected fields of study at specific points in time.

It is anticipated that future versions of RRPM will include a stochastic enrollment forecasting module which will eliminate the need for an exogenous degree profile matrix and distribution vector.

An alternative approach to estimating future degree cost is under study by a group at the University of California. Wagner and Weathersby, in an unpublished monograph, have proposed a system for estimating degree cost based on the prior expectation of costs. Quoting from their monograph[31]

> In outline, this method first calculates the expected costs of admitting a student to a degree program. It then uses transition probabilities to calculate the probabilities of receiving some specified degree given that the student has been admitted to a program. Using these probabilities and the vector of expected total costs, a system of M linear equations in N unknowns is solved, where M is the number of degree programs and N is the number of degrees offered. (In general M=N), the N unknowns are the "prior costs" per degree type i, i=1,...,N.

Basically, the rationale underlying this approach is that resource commitment, and therefore decision-making, takes place at the point of admitting the student to the system. Therefore, the relevant data is that which reflects such resource commitment. While this may be true for individual institutions, such an approach may not lend itself to interinstitutional exchange of instructional cost data.

---

[31] W. Gary Wagner and George B. Weathersby, "Alternative Costs per Degree Calculations," an unpublished monograph, University of California, Office of the Vice-President for Planning and Analysis, November 18, 1970, p. 3.

APPENDIX

Glossary of Notation

(to be added)

BIBLIOGRAPHY

(to be added)

APPENDIX G

COST FINDING PRINCIPLES COMPUTER PROGRAMS

APPENDIX G

COST FINDING PRINCIPLES COMPUTER PROGRAMS

At the time of this writing, the CFP programs have been implemented at the following institutions:

University of California Los Angeles	IBM	360/91 - O/S
Dartmouth College	Honeywell	H-200
Florida Atlantic University	IBM	360/40 - DOS
University of Illinois	IBM	360/50 - O/S
Stanford University	IBM	360/40 - O/S
State Center Junior College District, Fresno	Honeywell	H-200
University of Utah	IBM	360/40 - DOS
University of Washington	Burroughs	B-5500

In addition to their obvious utility in simplifying the enormous task presented to the nine participating subcontracting institutions, the programs can be utilized for such activities as:

1. Preparing and/or validating budgeting formulas (CFP 06 - CFP 08).

2. Reporting to a funding agency using a program code other than the WICHE/NCHEMS PCS. (CFP 01 - CFP 05).

3. Performing other cost studies (CFP 01 - CFP 08).

Documentation Abstract

PROGRAM CFP01

Purpose

This program will accept four parameter cards from the on-site card reader, reconcile the data located on these cards, and use the parameter information to reconcile institutional accounting information (IAI) resident on either punched cards or magnetic tapes.

Input

This program will accept Institutional Accounting Information (IAI) as well as parameter cards that describe the location of IAI data on either magnetic type or card media.

The three types of accounting information provided to the program are:

1. Institutional Account Number Account Balance or Institutional Accounting Number/Account Transaction File
2. Institutional Account Number/Account Name File
3. Institutional Account Number/PCS Account Number Crossover Parameter File

Output

CFP01 will generate a printed Audit Report and a magnetic tape. The Aduit Report will indicate any IAI errors detected while the program is accepting IAI information.

The magnetic tape generated by CFP01 contains four record types:

1. CFP Initial Record - contains user supplied data, institution name, and other data unique to the CFP programs for a given institution.

2. IAI Account Name Record - contains the institutional account number and account name.

3. IAI Account Transaction Record - contains either an institutional account number and account balance or an institutional account number and transaction amount.

4. Institutional IAI/PCS Percentage Crossover Record - contains institutional account number, PCS account number, crossover percentage.

Program Processing in General

After opening the output tape to be generated by the program, CFP01 will accept parameter cards from the reader. Each parameter card accepted will be printed on the Audit Report and screened for correct information in relevant fields. Errors detected in parameter cards will be printed on the Audit Report immediately after the parameter card to which they pertain.

If no parameter errors are detected in the data cards, the program will store the data wrought from the parameter cards, construct and write the CFP Initial Tape Record, and request the first input reel or card deck be submitted for input. The order in which the input is requested is:

1. Institutional Account Number/Account Name File

2. Institutional Account Number/Account Transaction File or Account Balance File

3. Institutional Account Number/PCS Account Number Crossover Parameter File

The type of processing performed by the CFP01 program depends upon the type of file reconcilement attempted.

1. Institutional Account Number/Account Name File Processing

   Each record accepted from this file is inspected to locate the Institutional Account Number and Institutional Account Name. As each account number/name doublet is isolated from the input file, it is used to construct an IAI Account Name Record.

2. Institutional Account Number/Account Transaction File Processing

   Records accepted from this file are scanned to locate the Institutional Account Number and Account Transaction. The dollar amount submitted by the user in this file may be either an account (period-to-date) balance or a transaction amount.

   The account number and transaction amount obtained from this file are used to construct an IAI Account Transaction Record.

3. Institutional Account Number/PCS Account Number Crossover Parameter File Processing

   Each record obtained from this file is inspected to locate an institutional account number, a PCS account number, and a crossover percentage. The data obtained from this file are used to create an institutional/PCS Account Crossover Record.

Upon completion of the three-file reconciliation processes, CFP01 will close the output tape, display the end-of-job control totals relative to all types of data read and written on the Audit Report, and terminate.

Documentation Abstract

PROGRAM CFP03

Purpose

This program will accept a magnetic tape generated by program CFP01 and sorted by program CFP02, and generate an Institution/PCS Crossover Report and an Institution/PCS Crossover Tape for use by programs CFP04 (sort) and CFP05.

Input

The magnetic tape accepted by CFP03 contains 80-character logical records, grouped 20 to a block to form a physical block length of 1600 characters.

Output

The CFP03 program produces an Institution/PCS Crossover Tape and Report.

The magnetic tape prodiced by CFP03 contains 124 character logical records, grouped 10 records to a block to form a physical block length of 1240 characters.

Program Processing in General

Upon initiation, CFP03 will open the input and output tape files (with appropriate label checking and creating processes) and the Institution/PCS Crossover Report. The CFP Initial Record is read from the input tape, the date and institution name fields inserted in the report heading and the output tape's CFP Initial Record, and the CFP Initial Record written on the output tape.

The program will accept records from the input tape and construct Institutional/PCS Crossover Records. Records accepted from the input tape are assumed to enter in the following order for each institutional account:

A. IAI Account Name Record (1 only per account)

B. IAI Account Transaction Record (1-n records)

C. Institution/PCS Account Crossover Record (1-n records)

Control Totals

CFP03 maintains control totals for each input and output file and displays them on the printed report at the end of the job.

Documentation Abstract

PROGRAM CFP05

Purpose

This program will accept a magnetic tape generated by program CFP03 (and sorted by program CFP04) containing crossover amounts between institutional and PCS accounting structures and generate a PCS/Institutional Account Crossover Report and a PCS Account Balance magnetic tape. The magnetic tape produced by CFP05 is used by programs CFP06, CFP08 (sort), and CFP08 to generate PCS cost center balances from data supplied initially in program CFP01.

Input

The magnetic tape accepted by CFP05 contains two types of records. These records are:

A. CFP Initial Record - contains data supplied by user in program CFP01, institution name, and other data required by CFP computer programs.

B. Institutional/PCS Account Number Crossover Record - contains intersystem crossover parameters for each institutional account.

Output

Program CFP05 produces a PCS Account Balance magnetic tape and a PCS/Institutional Account Crossover Report in CFP cost center order.

Program Processing in General

Control Totals

CFP05 will maintain control totals for each input and output file and display these totals on the operator's console at the end of the job.

Documentation Abstract

PROGRAM CFP06

Purpose

This program will accept cards describing PCS account parameters and write these parameters on magnetic tape for later use by programs CFP07 and CFP08.

Input

CFP06 will accept parameter cards and, based upon these parameter cards, accept additional information regarding allocation variables (e.g., - F + 2, credit hours, contact hours, etc.) by CFP cost center from either magnetic tape or punched cards.

Output

The output produced by CFP06 is an Audit Report noting data reconciliation errors and a magnetic tape containing data drawn from the input files.

Control Totals

Control totals depicting the quantity of each parameter card type accepted by the program are maintained and printed on the Audit Report at the end-of-job.

Documentation Abstract

PROGRAM CFP08

Purpose

This program will accept PCS account parameters and user-supplied allocation commands and perform interaccount dollar transfers based on allocation statements. User statements prepared in a free-form English language text are used to direct the program's allocation process. A joint audit/allocation report is generated that describes the status of PCS accounts and the allocation process as it is undertaken. A magnetic tape is produced at the end of each allocation containing the status of each PCS account at the time of program termination. An alternate feature of this program supports magnetic tape copies of the entire PCS array after each user command is effected.

Input

This program accepts a magnetic tape generated by CFP07 containing PCS account parameters and punched cards containing user supplied allocation commands.

The command language control cards accepted for input by this program contain free-form English language descriptions of PCS account manipulations desired by the user. Each input card is split into three areas:

A. Card Sequence Number (card columns 1-4).

B. Source Statement Area (card columns 6-71).

C. Card Identification Field (card columns 72-80).

The command language supported in these cards is designed to afford the user the utmost flexibility in establishing allocation techniques. The statements comprising the command language appear below.

1. SET Statement

The SET Statement permits the user to establish an account balance different from that either provided by the PCS Account Balance tape or established by account transfers during the program's execution.

Format

SET #aaa...a TO $nnn...n

Example -

SET #04096388 TO $85

SET #01036046 TO $18465

2. ESTABLISH Statement

PCS accounts not defined on the PCS Account Balances tape may be inaugurated by use of this statement.

Format

ESTABLISH #aaa...a_1, #aaa...a_2, #aaa...a_3...#aaa...a_n

Example -

ESTABLISH #04196533, #064149938, ESTABLISH #01639400

3. TRANSFER Statement

PCS account balances may be transferred between accounts by use of this statement. The percentage preceding each PCS account number is multiplied by the balance of the PCS account, added to any preceding/succeeding percentage account balance products, and algebraically summed with the existing balance of the receiving PCS account.

Format

TRANSFER $nnn.nn_1$% of $\#aaa...a_1$ AND $nnn.nn_2$% of $\#aaa...a_2$

AND $...nnn.nn_3$% OF $\#aaa...a_3$ OT $\#aaa...a_4$

Example -

TRANSFER 8.60% of #03699420 AND 46.95% OF #01800000 AND 86.0% of #01903093 TO #06041938

TRANSFER 46.2% of #04163980 TO #01914068

4. ALLOCATE Statement

Inter-PCS account allocations may be performed using this Statement. The PCS account balances enumerated directly after the word ALLOCATE are distributed across PCS accounts cited immediately after the word ACROSS using the formula cited after the word USING. As each inter-PCS account is allocated, the "sending" PCS account balance is zeroed.

Format

ALLOCATE #aaa...a_1 TO #aaa...a_2,
#aaa...a_3 TO #aaa...a_4,
#aaa...a_5 TO #aaa...a_6

ACROSS #aaa...a_7 TO #aaa...a_8
#aaa...a_9 TO #aaa...a_{10}, ...
#aaa...a_{11}TO #aaa...a_{12}

USING nnn.nn_1% OF PAR mm_1 ± nnn.nn_2% OF PAR mm_2 ±
nnn.nn_3% of PAR mm_3

Example -

ALLOCATE #01046190 TO #01046268, AND
#04938632 AND #06369412 TO #06369500

ACROSS #01954128 TO #01955000, AND
#03639140 TO #03640000, AND #06838041

USING 2.0% OF PAR 16 + 36.5% OF PAR 14 -
18.65% OF PAR 3

Output

CFP08 will generate an Audit/Status Report containing the step-by-step allocation for each affected CFP cost center as well as magnetic tape containing the status of each PCS Account.

Program Processing in General

After opening the input and output files assigned to the program, CFP08 will zero the PCS array, read tape records generated by CFP07, and insert values in the array for each PCS account.

When the input tape reaches end-of-file, the program will rewind the tape, accept command statements from the reader, pose the command statement, and, if no syntax errors are present in the command statement, execute the command. Errors present in the user-supplied language will be noted on the printer.

GLOSSARY

GLOSSARY

Term	Description
A-21 rate	The overhead rate determined by principles defined in the Office of Management and Budget Circular No. A-21.
Academic Support Program	A support program consisting of those program elements which directly assist the academic functions of the institution.
Accelerated Depreciation	An allocation method which provides for higher depreciation changes in the first years of an asset's life and steadily declining depreciation charges in successive years, based on the assumption that obsolescence or usefulness is greatest early in the life of an asset.
Activity Crossover	A process whereby the activities supported by the expenditures recorded in a fund accounting system are matched with the same activities associated with a program classification structure.
Allocation	The process of apportioning the costs residing in a donor cost center (i.e. support cost center) to one or more recipient cost centers usually based on statistical data of the institution.
Allocation Parameter	Institutional statistical data which serve as a proxy measure for actual resource utilization.
Assignable square feet	The sum of all areas on all floors of a building assigned to, or available for assignment to, an occupant, including every type of space functionally usable by an occupant (excepting custodial, circulation, and mechanical areas).
Average Cost	The total cost attributed to a cost center divided by the total number of units of output produced by that cost center. Also referred to as unit cost.

Term	Description
Budget	A statement of proposed expenditures for a fixed period or for a specific project, or program, and the proposed means of financing the expenditures.
Buildings	A component of an institution's assets which refers to facilities permanently affixed to land and the remodeling of such facilities, including the associated heating systems, electrical systems, fixed equipment, sewers, sidewalks and driveways, within five feet of the building.
Capital Cost	The valuation placed upon the services provided by land, buildings and equipment owned and utilized by an institution during any time period.
Cost	The measure in dollars of institutional resources used in the process of providing institutional outputs during a given time period.
Cost Accounting	An expanded and ongoing phase of the general or financial accounting system which provides management promptly with unit cost information which can be used to interpret expenditures incurred in the operation of the business.
Cost Aggregation Structure	A specified aggregation of the activities within the programs identified in the Program Classification Structure to a level which results in cost centers containing relatively homogeneous activities.
Cost Category	A class of expenses representing a type of resource utilized. The major categories of cost for Cost Finding Principles are salaries and wages, supplies and expense, and capital assets.
Cost Center	The basic unit in the cost aggregation structure. For cost finding purposes, the cost centers are program elements (or aggregations thereof) identified in the Program Classification Structure to which costs can be assigned. Cost centers may be at the subprogram, program category, program subcategory, or program sector level of the PCS.

Term	Description
Cost Finding	An analytical process periodically used in lieu of a formal cost accounting system which makes use of accounting data as well as other data available within the institution in order to arrive at unit cost information for all activities conducted by the institution.
Cross-Allocation	A method for apportioning costs among programs which places no restrictions on the interactions between any two programs in the production process. The distinct line between primary and support programs is blurred as any program may support another and at the same time produce output for final demand. Also referred to as simultaneous allocation.
Crossover	See Activity Crossover.
Current Operating Expenses	See Operating Expenses.
Depreciation	The process of apportioning the cost or other basic value of an asset, less salvage value (if any), over the estimated useful life of the asset in a systematic and rational manner.
Direct Allocation	A method for apportioning the costs of support programs to primary programs based on the premise that all support program activities contribute directly and exclusively to the primary programs. The costs associated with support programs are not allocated to other support programs as an intermediary step in the direct allocation process.
Distribution	The process of attributing cost categories to a given activity in a manner which measures resources utilized by that activity. Within the cost finding process, all costs are distributed to cost centers prior to the allocation of support costs.
Donor Cost Center	A cost aggregation point from which the related costs are apportioned to recipient cost centers through the use of an allocation technique and allocation parameters.

Term	Description
Equipment	A component of an institution's assets which includes movable items having a useful life of more than one year and a cost above an institutionally defined minimum.
Factors of Production	The resources utilized by an institution in achieving its stated objectives including faculty and supporting staff, supplies and expense, and capital assets.
Faculty	The persons employed by an institution who have all or some portion of their appointment classified as Instructional assignment using the guidelines set forth in the *Manual for Manpower Accounting in Higher Education*.
Faculty Activity Analysis	A process by which the activities of faculty are analyzed in order to determine contributions to institutional programs. As used by Cost Finding Principles, a method for distributing salaries and wages of the instructional staff to cost centers based on the *actual* tasks performed by a faculty member in fulfillment of his contractual obligation.
Faculty Assignment Analysis	A process by which the assignments of faculty are analyzed in order to determine expected contributions to institutional programs. As used by Cost Finding Principles, a method for distributing salaries and wages of the instructional staff to cost centers based on the *expected* tasks to be performed by a faculty member in fulfillment of his contractual obligation.
Faculty Contact Hour	One hour (or period) spent by one faculty member in contact with a scheduled classroom course or section. Also known as a weekly faculty contact hour.
Full Costing	The process whereby all of the resources utilized by an institution in producing an output are identified and associated with that output.

Term	Description
Full-Time Equivalent	The equivalent of one person who is deemed to be carrying a full load or having a full-time appointment in terms of institutionally agreed upon conventions for converting numbers of specific individuals (students or employees) to equivalent number of full-time people.
Fund Accounting	A method of recording assets, liabilities, revenues, and expenditures in distinct accounting entities which are established for the purpose of carrying on specific activities or attaining certain objectives in accordance with special regulations, restrictions, or limitations. Also referred to as institutional or governmental accounting.
Gross Square Feet	The sum of the floor areas included within the outside faces of exterior walls for all stories or areas, which have floor surfaces.
High-Order Cost Center	One that receives a greater amount of services from other cost centers while providing relatively fewer services. High-low priority ranking of cost centers is employed in the recursive allocation technique.
Implicit Cost	A generic term used in economics to denote an estimated value when no cash payment is made that would establish an absolute value.
Incremental Cost	The change in total costs which results from going from one level of output to another.
Independent Operations Program	A support program consisting of those program elements which are independent of, or unrelated to, the basic missions of the institution.
Institutional Accounting	See fund accounting.
Institutional Support Program	A support program consisting of those activities within the institution which provide campus-wide support to the other programs.
Instruction Program	A primary program consisting of all formal instructional activities in which a student engages to earn credit toward a degree or certificate.

Term	Description
Joint Product Cost	The cost incurred in association with an activity which produces outputs for more than one program.
Land	A component of capital assets which includes the building sites, parking lots, athletic fields, and other real property owned and utilized by an institution.
Low-Order Cost Center	One that provides a greater amount of services to other cost centers while receiving relatively fewer services. High-low priority ranking of cost centers is employed in the recursive allocation technique.
Marginal Cost	The increase in total cost caused by the production of one additional unit of output.
Net Square Feet	The sum of all areas on all floors of a building including hallways, custodial, circulation, and mechanical areas.
Operating Expenses	Charges incurred, whether paid or unpaid, for operation, maintenance, and interest and other charges for operating purposes during the fiscal period.
Opportunity Cost	A benefit foregone. The cost of any resource with alternative uses that is committed to the production of higher education outputs.
Organized Research Program	A primary program consisting of those research-related program elements established within the institution under the terms of agreement with agencies external to the institution or separately budgeted and conducted with internal funds.
Primary Cost Center	A cost aggregation point identified for cost finding purposes within the primary programs (i.e. instruction, research, and public services) of the Program Classification Structure.
Primary Programs	That portion of the Program Classification Structure that contains the activities directly related to the accomplishment of the missions of higher education.

Term	Description
Program	A stratum in the Program Classification Structure hierarchy. The major institutional missions and related support objectives. The PCS is based on seven programs.
Program Classification Structure	A classification system that categorizes the activities of an organization according to their relationship to the organization's objectives. Reference to the publication by that name developed by the National Center for Higher Education Management Systems.
Program Element	The lowest level of aggregation in the Program Classification Structure hierarchy. The program element represents the smallest unique collection of resources that are output producing activities (i.e., a collection of resources, technologies, and policies which, through their integrated operation, produce goods or services that are of value to the organization because they contribute to the achievement of an institutional objective.
Program Measures	The quantitative indicators of resource utilization, activities, and outputs associated with a program element.
Public Service Program	A primary program consisting of those program elements within the institution which produce outputs directed toward the benefit of the community or individuals residing within the geographic service area of the institution.
Recipient Cost Center	A cost aggregation point to which costs are assigned from donor cost centers through the use of an allocation technique.
Recursive Allocation	A method for apportioning the costs of support programs to primary programs based on the premise that support program activities may contribute directly to any program (support or primary) which has a higher-order ranking. Implicit to the recursive allocation technique is the ability to rank all cost centers into a high-low order with the low-order cost centers being totally distributed among the higher-order cost centers. Also referred to as step-down allocation.

Term	Description
Replacement Cost	The original value of an asset expressed in current dollars. Replacement cost is calculated by applying a replacement cost index to the historical cost of an asset.
Replacement Cost Index	A ratio of current costs to original costs for a particular class of assets.
Salaries and Wages	The gross cash salary of the individual from all institutional sources before deductions or exclusions, together with all staff benefits, directly and explicitly identifiable with the individual as to dollar amount and value, e.g. employer's FICA contribution, employer's contribution to TIAA-CREF or other retirement fund, employer's share of medical, hospital, accident, or life insurance premiums, and market value of goods or services provided to an employee for personal use or consumption.
Salvage Value	The sale, trade-in, scrap, or junk value of an asset when it is no longer useful to an institution.
Section	A group of students assembled for instruction in a regularly scheduled meeting of a course.
Simultaneous Allocation	See cross-allocation.
Step-down Allocation	See recursive allocation.
Straight-line Depreciation	The allocation of the cost of an asset equally over its useful life based on the assumption that depreciation is a function of time rather than of use.
Student	A person registered in an institution of higher education and pursuing a course of study.
Student Credit Hour	A unit of measure which represents one student engaged in an activity for which one hour of credit toward a degree or other certificate will be granted upon successful completion.

Term	Description
Student Service Program	A support program consisting of those program elements related to the institution's student body, excluding the degree-related curriculum and student records.
Supplies and Expense	All operating expenses other than salaries and wages.
Support Cost Center	A cost aggregation point identified for cost finding purposes within the support programs (i.e., academic support, student support, institutional support, and independent operations) of the Program Classification Structure.
Support Programs	That portion of the Program Classification Structure that contains those activities which are necessary or vital for the successful operation of the primary programs.
Transfer Payments	Funds received by the institutions from government, business, and other sources which are subsequently distributed to third parties, these funds do not represent payment for services rendered by the institution.
Unit Cost	See average cost.
Useful Life	The period of economic utility during which an asset renders service to an institution.

NOTES

NOTES

1. Robert Lamson and John Powel, A Study of the Costs of Graduate Education (Washington, D.C.: Council of Graduate Schools, 1971).

2. American Council on Education, College and University Business Administration (Washington, D.C.: 1968), p. 278.

3. American Hospital Association, Cost Finding and Rate Setting for Hospitals (Chicago: 1968), p. 9.

4. The American Heritage Dictionary of the English Language, William Morris, editor (New York: American Heritage Publishing Company, Inc. and Houghton Mifflin Company, 1969).

5. Adolph Mautz, Othel Curry, and George Frank, Cost Accounting (Cincinnati, Ohio: South-Western Publishing Company, 1962), p. 22.

6. U.S. Department of Health, Education, and Welfare, Social and Rehabilitation Service, The Cost and Output of Graduate Social Work Education: An Exploratory Study (Stanford, Conn.: Cooper and Company, 1970), p. 19.

7. Robert N. Anthony, "What Should 'Cost' Mean?" Harvard Business Review, Vol. 49 (May-June, 1970), 121.

8. Taken in part from Lamson and Powel, op. cit.

9. American Council on Education, op cit., p. 194.

10. Ibid., p. 143.

11. Charles R. Thomas, Data Element Dictionary: Staff, Facilities, Course, Faculty, Finance, 1st ed. (Boulder, Colorado: Western Interstate Commission for Higher Education, April, 1970).

12. Warren W. Gulko, Program Classification Structure, Preliminary Edition for Review (Boulder, Colorado: Western Interstate Commission for Higher Education, June, 1970), pp. 1-27 through 1-34 reprinted in part.

13. W. John Minter, Manual for Manpower Accounting in Higher Education (to be published by the National Center for Educational Statistics, 1972).

14. Harry A. Finney and H. E. Miller, *Principles of Accounting: Advanced*, 5th ed. (New York: Prentice-Hall, Inc., 1960). p. 7.

15. Office of Management and Budget, *Circular No. A-21* (Washington D.C.: OMB, Revised September 2, 1970), p. 10.

16. Lamson and Powel, *op. cit.*

17. The National Center for Higher Education Management Systems recently initiated the Information Exchange Procedures (IEP) Project. The primary function of IEP is to define conventions regarding the manner in which institutional data may be aggregated and arrayed for interinstitutional comparison.

18. Warren W. Gulko, *Unit Cost of Instruction: A Methodological Approach* (Boulder, Colorado: Western Interstate Commission for Higher Education, January, 1971).

2941736000045200:
3M:1271:WICHE:HIRSCH:2BA34

Advisory Structure for the
NATIONAL CENTER FOR HIGHER EDUCATION MANAGEMENT SYSTEMS at WICHE

EXECUTIVE COMMITTEE

Dr. Frank C. Abbott
Executive Director
Colorado Commission on Higher Education
(July 1, 1973)
Rutherford H. Adkins
Vice-President
Fisk University
(July 1, 1973)
Dr. Thomas F. Bates
Vice-President for Planning
The Pennsylvania State University
(July 1, 1973)
Donald H. Clark
Chairman of the Higher Education
Advisory Committee to the Midwest
Council of State Governments
(July 1, 1973)
Dr. Joseph P. Cosand
President
The Junior College District of St. Louis
(July 1, 1973)
Kenneth Creighton
Deputy Vice-President for Finance
Stanford University
(July 1, 1973)
Paul V. Cusick
Vice-President for Business and Fiscal Relations
Massachusetts Institute of Technology
(July 1, 1972)
Ted Davis
Financial Vice-President
University of Utah
(July 1, 1973)
Dr. Alan Ferguson
Executive Director
New England Board of Higher Education
(July 1, 1973)
Loren Furtado
Assistant Vice-President
University of California
(July 1, 1972)
Richard Gibb
Commissioner of Higher Education
South Dakota State Board of Regents
(July 1, 1973)
Robert L. Harris
Vice-Chancellor
California Community Colleges
(July 1, 1972)
Dr. Bert Y. Kersh
Dean of Faculty
Oregon College of Education
(July 1, 1972)
Samuel Lawrence
Vice-President for Administration
Cornell University
(July 1, 1972)
Dr. Roy Lieuallen
Chancellor
Oregon State System of Higher Education
(July 1, 1972)
Douglas MacLean
Vice-President for Staff Services
University of Houston
(July 1, 1973)
Dr. Robert H. McCabe
Executive Vice-President
Miami-Dade Junior College
(July 1, 1972)
Dr. Robert McCambridge
Assistant Commissioner for
Higher Education Planning
The University of the State of New York
(July 1, 1973)
Robert Mautz
Chancellor
State University System of Florida
(July 1, 1972)
Dr. G. Theodore Mitau
Chancellor
The Minnesota State College System
(July 1, 1973)
Gordon Osborn
Assistant Vice-Chancellor for Management
State University of New York
(July 1, 1973)
James Ryan—(Chairman)
Vice-President for Planning and Budgeting
University of Washington
(July 1, 1972)
Dr. E. F. Schietinger
Associate Director for Research
Southern Regional Education Board
(July 1, 1972)
Dr. Thomas S. Smith
President
Lawrence University
(July 1, 1972)
Dr. Martin Zeigler
Associate Provost
University of Illinois
(July 1, 1972)

TECHNICAL COUNCIL

Dr. W. K. Boutwell
Director
Office of Planning and Evaluation
Florida State University System
(July 1, 1973)
Mrs. Mary Jane Calais
Coordinator
Finance Department
The Junior College District of St. Louis
(July 1, 1973)
Denis Curry—(Chairman)
Deputy Coordinator for Information Systems
Washington Council on Higher Education
(July 1, 1972)
John Chaney
Director
University Office of Administrative Data Processing
University of Illinois
(July 1, 1972)
William Dempsey
Assistant to the President
State University of New York at Plattsburgh
(July 1, 1973)
James Eden
Director of Administrative Services
and Assistant to the President
University of Rochester
(July 1, 1972)
John Gwynn
Associate Director
Project INFO
Stanford University
(July 1, 1972)
Dr. Hans H. Jenny
Vice-President of Finance and Business
Director of Administrative Computer Services
College of Wooster
(July 1, 1973)
Dr. George Kaludis
Vice-Chancellor
Vanderbilt University
(July 1, 1973)
Garland P. Peed
Assistant Superintendent, Business
State Center Junior College District
(July 1, 1973)
Ron Sapp
Director
Office of Administrative Systems
Johns Hopkins University
(July 1, 1973)
Dr. George B. Weathersby
Assistant Director
Office of Analytical Studies
University of California
(July 1, 1972)

END

DEPT. OF HEALTH
EDUCATION AND
WELFARE
U.S. OFFICE OF
EDUCATION
ERIC
DATE FILMED

7 30 73